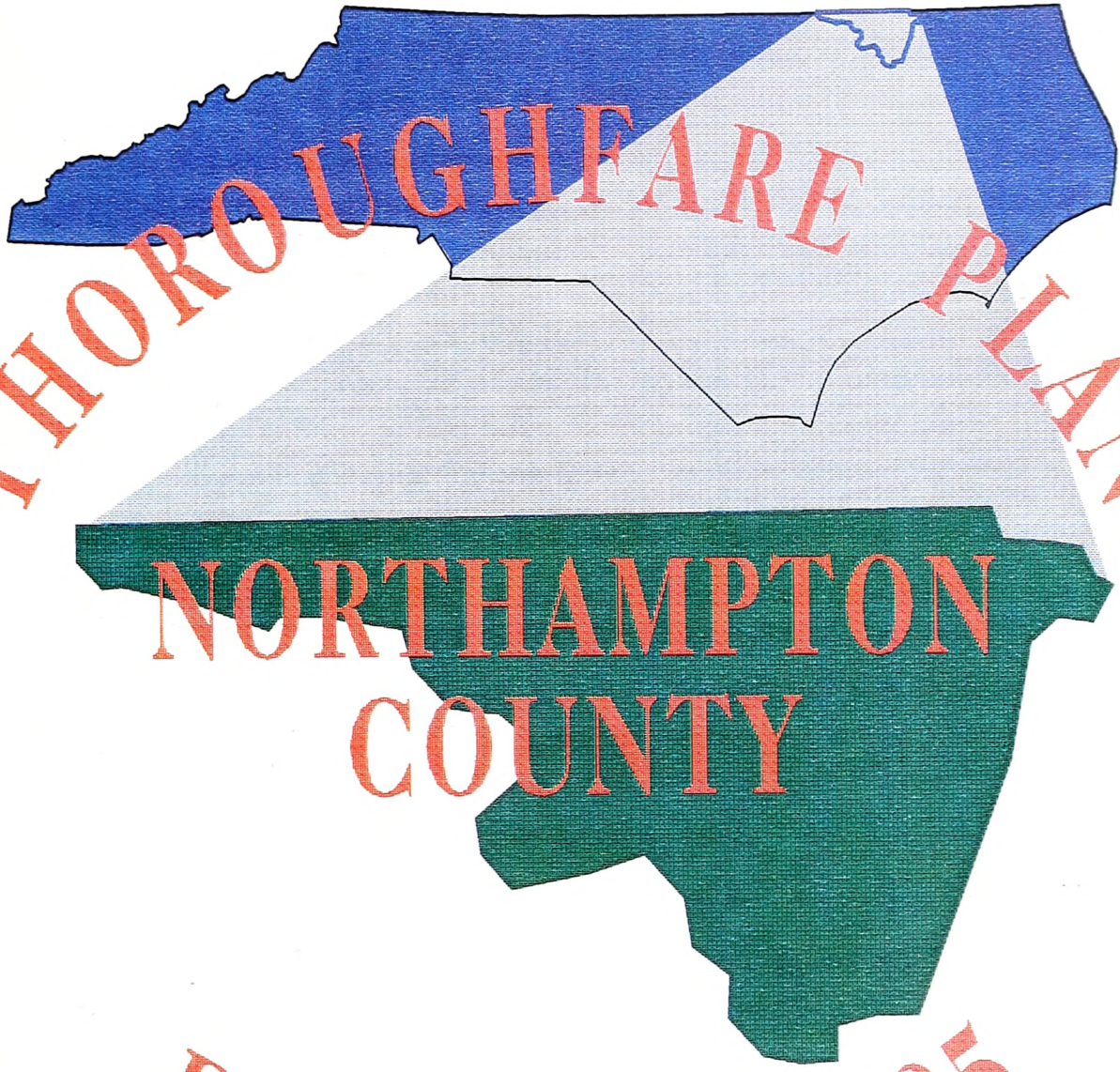
North Carolina Department of Transportation
Statewide Planning Branch
Small Urban Planning Unit



THOROUGHFARE PLAN

NORTHAMPTON COUNTY

DECEMBER 1995

THOROUGHFARE PLAN
FOR
NORTHAMPTON COUNTY

Prepared by the:
Statewide Planning Branch
Division of Highways
North Carolina Department of Transportation

In cooperation with:
Northampton County
Northampton County Economic Development Commission
Federal Highway Administration
U.S. Department of Transportation

December, 1995

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Chapter 1

INTRODUCTION

This report documents the findings of a study of Northampton County's Thoroughfare System that began in 1992 and culminated in the mutual adoption of the 1995 Northampton County Thoroughfare Plan. The adopted Northampton County Thoroughfare Plan is shown in Figure 1.

Northampton County is located in the northeastern portion of the state. The county is bounded on the north by the Virginia Counties of Brunswick, Greenville, and Southampton, by Hertford County on the east, by Bertie and Halifax County on the south, and by Warren County on the west. The location of Northampton County is shown in Figure 2.

The Statewide Planning Branch was contacted in 1992 by the Northampton County Commissioners to adequately plan for the future transportation needs of the county. In conjunction with the Northampton County Thoroughfare Study, the Statewide Planning Unit began the update of the Garysburg Thoroughfare Plan, which was completed in 1994. A report on Gaston, Roanoke Rapids, and Weldon was completed in 1992.

In June 1993, the staff from Statewide Planning met with the local officials to determine the transportation needs of the area. The primary concern of the County Commissioners' was the US 158 Intrastate corridor. US 158 is the major east-west corridor in the county, and this facility is scheduled to be improved to a four lane facility between 2002 and 2007. The thoroughfare plan will be used as a guide for the improvement of US 158. During the study, it was noted that several other facilities needed to be studied. One, was a connector between US 158 and I-95, which was accomplished in the Garysburg Thoroughfare Plan. The others, were bypasses around Faison's Old Tavern, Jackson, Conway, Rich Square, and Woodland that are needed to relieve congestion and truck traffic.

The primary objective of thoroughfare planning is to enable the transportation network to be progressively developed to adequately meet the transportation needs of the County as land develops and traffic increases. The principles of basic thoroughfare planning, as described in Chapter 7 were used to develop this plan. It is based on existing traffic, population, and land use data. Year 2020 average daily traffic (ADT) projections were used to determine capacity deficiencies. Major and minor arterials and collectors were located based on field investigations, existing and anticipated land uses, and environmental considerations. The adopted Thoroughfare Plan is expected to meet the demands of Northampton County for the planning period of 1994-2020.

A complete analysis of the Northampton County Thoroughfare Plan recommendations is located in Chapter 2. Some highlights of the 1994 Thoroughfare Plan are:

1) I-95 - This major north-south route in the United States is projected to be over capacity in 2020. To improve capacity, it is recommended that I-95 be widened to six lanes.

2) US 158 - As part of the intrastate system, this facility will be improved to a four-lane divided highway. The corridor is proposed to run on mostly new location throughout the County. The facility will run from Halifax county, south of Garysburg, on and near SR 1311 (Jackson Bypass Road), south of Faison's Old Tavern and Conway, and connect to the Murfreesboro Bypass near Hertford County. The existing US 158 that runs south of SR 1311 towards Jackson will be renamed.

3) US 258 - Reroute US 258 east of Rich Square (Rich Square Bypass). The proposed bypass will alleviate anticipated congestion problems on the existing US 258.

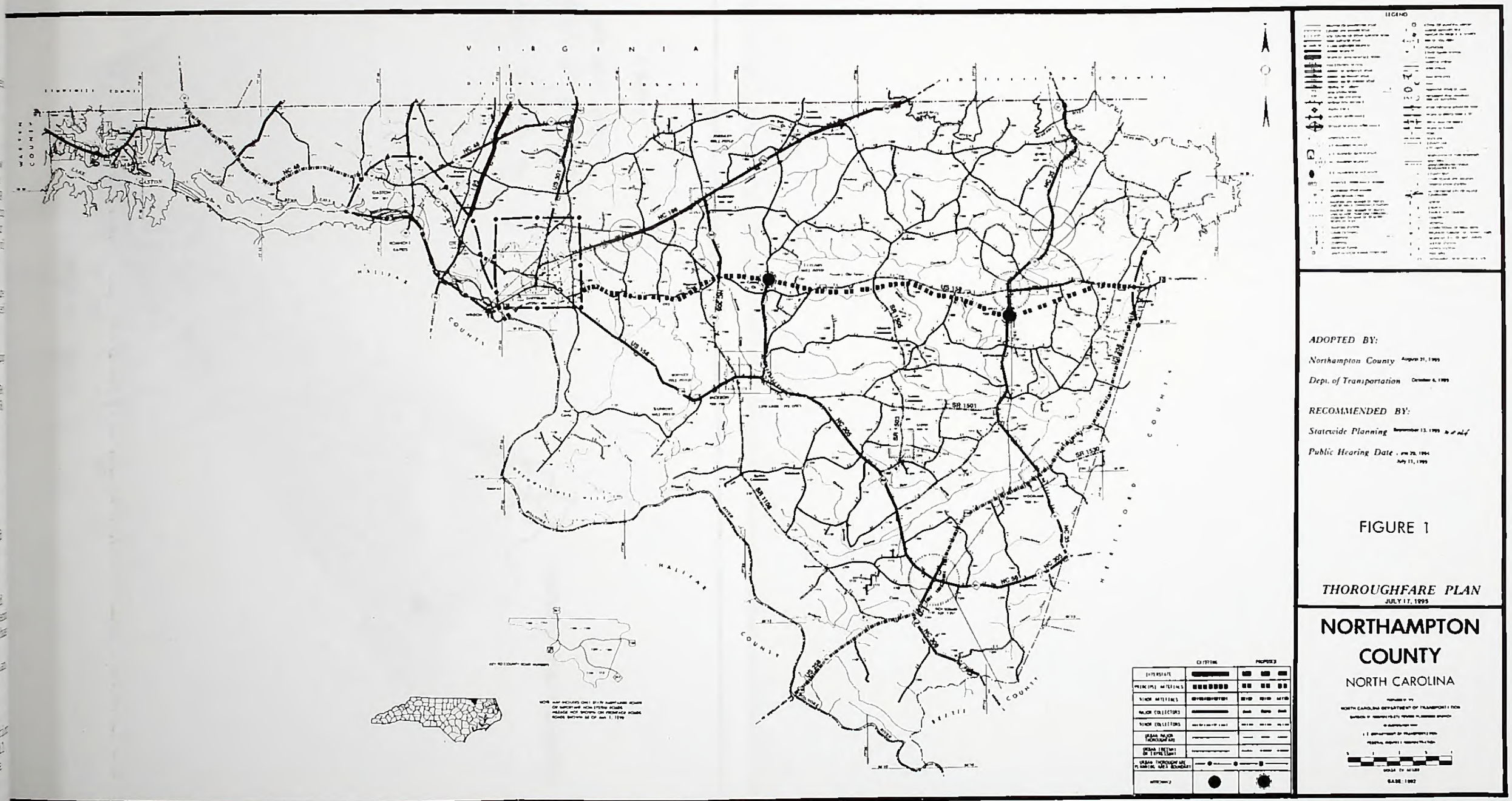
4) NC 305 Realignment - Reroute NC 305 east of the existing US 158 / NC 305 intersection, east of Jackson. The proposed NC 305 will be rerouted on existing US 158, SR 1333 (Severn High Bridge Road), and the proposed US 158 until it turns towards Seaboard. This will remove through truck traffic in downtown Jackson.

5) NC 35 Realignment - To allow for smooth flow, it is recommended that the southern portion of NC 35 in Woodland be realigned with the northern portion.

Other recommendations are minor or maintenance related, and are covered in Chapter 2.

The North Carolina Department of Transportation and Northampton County are jointly responsible for the proposed thoroughfare improvements. Cooperation between the state and local governmental units is of primary concern. The plan has been mutually adopted by all parties and it is the responsibility of the local government to implement the plan following the guidelines set forth in Chapter 3.

It should be emphasized that the adopted plan is based on anticipated growth of the area as currently perceived. Prior to the construction of projects, a more detailed study will be required to reconsider development trends and determine specific locations and design requirements.



ADOPTED BY:

Northampton County August 21, 1995

Dept. of Transportation October 6, 1995

RECOMMENDED BY:

Statewide Planning September 13, 1995

Public Hearing Date June 20, 1994
July 11, 1995

FIGURE 1

THOROUGHFARE PLAN
JULY 17, 1995

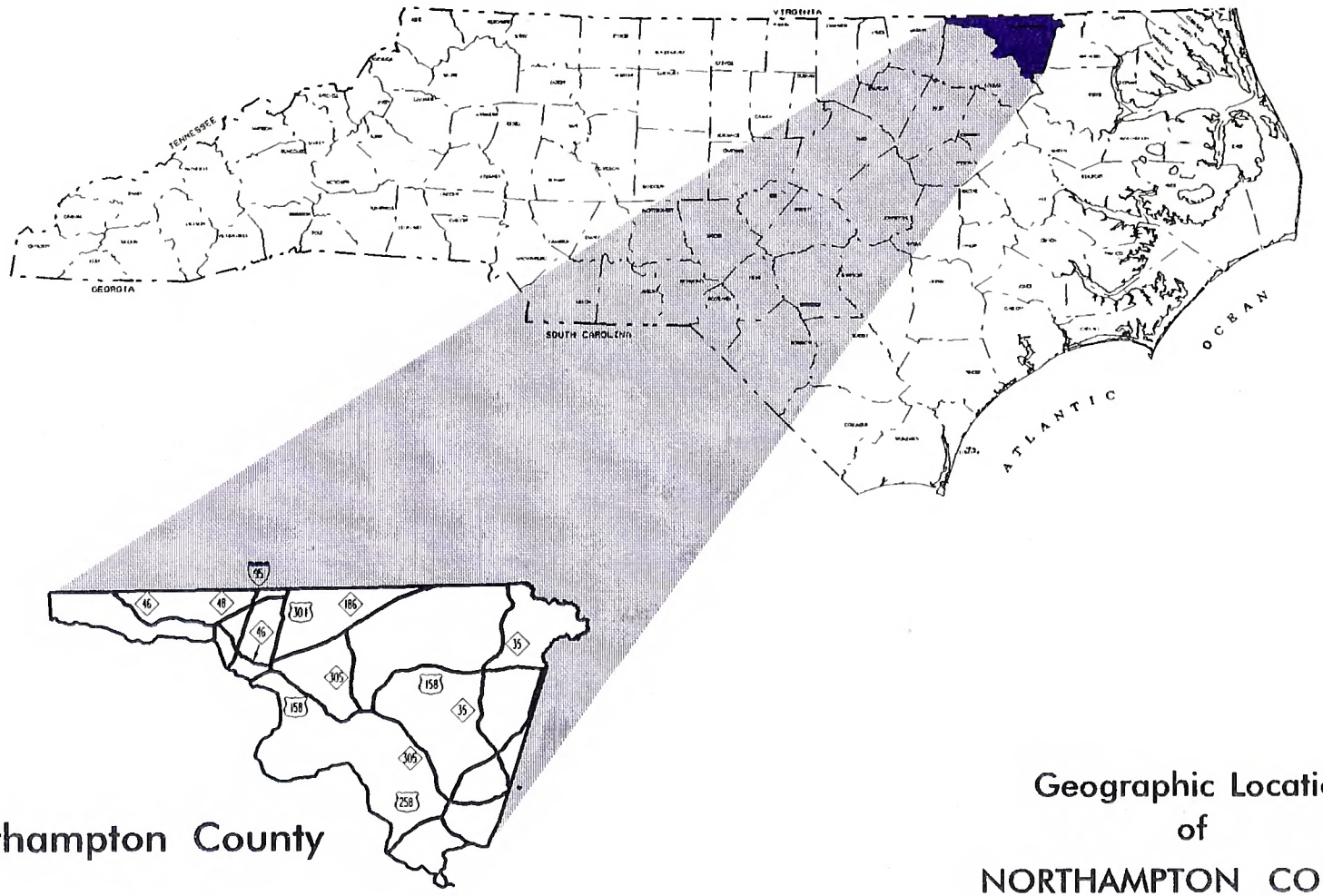
NORTHAMPTON COUNTY

NORTH CAROLINA

PREPARED BY THE
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS, TRANSPORTATION PLANNING BRANCH
IN COOPERATION WITH
THE U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

SCALE: 1" = 4 MILES

DATE: 1995



Geographic Location
of
NORTHAMPTON COUNTY
NORTH CAROLINA

FIGURE 2

Chapter 2

RECOMMENDED THOROUGHFARE PLAN

A thoroughfare plan study uncovers the need for new facilities, plus identifies existing and future deficiencies in the transportation system. The thoroughfare plan is a representation of the existing highway system by functional use, e.g., major arterials, minor arterials, etc., plus any new facilities that are needed. The planning methodology enables identification of deficiencies in the existing system, allowing compilation of a list of needed improvements.

This chapter presents an analysis and recommendations based on the ability of the existing street system to serve present and future travel desires as the area continues to grow. The usefulness of transportation planning is in the analysis of different highway configurations for their efficiency in serving the area. The recommended plan sets forth a system of thoroughfares to serve the anticipated traffic and land development needs for Northampton County. The primary goal of thoroughfare planning is to eliminate existing and projected system deficiencies that cause traffic congestion.

The recommended plan is based on the results of traffic forecasts that use data on traffic counts, population, housing, and employment. Each major road and highway in the county is analyzed to determine its ability to serve existing and future traffic demands. Proposals were based on the data collected.

Thoroughfare Plan Recommendations

The process of developing, testing and evaluating alternate plans involved several considerations. These included Northampton County's goals and objectives, identified deficiencies (see Chapter 4), environmental impacts, existing and anticipated land development, and travel services. Aerial photography, topographic mapping, field reconnaissance and discussion with local staff, officials and interested local citizens provided additional basis for identifying and evaluating alternate alignments. The following is a list of recommendations for the interstate, arterials and collector routes in Northampton County.

Principal Arterials

The roadways designated as Principal Arterials serve mainly statewide or interstate travel.

I-95 - This is a major north-south route in the eastern United States, which crosses the western part of the county. The four-lane divided corridor accommodates mostly through traffic with origins and destinations outside the county. It is anticipated that the entire Northampton County section will be over capacity in the year 2020; therefore, it is recommended that this route be widened to six lanes. No additional right-of-way will need to be purchased to accommodate the widening.

Cost estimates, located in Appendix D, reflect widening to the outside of the existing four lanes. If widening is made to the inside median, costs will be much lower, because overpass bridges may not need to be widened.

US 158 - US 158 is a major east-west route through the northern part of North Carolina that connects Winston Salem to Elizabeth City, and passes through Garysburg, Jackson, and Conway in Northampton County. US 158 is primarily a two lane facility in Northampton County that is currently operating below capacity. However, in the year 2020, US 158 is expected to be over capacity in the following sections: between SR 1368 (Atherton Street) and the Eastern City Limits in Jackson, and between NC 35 and the Western Planning Boundary of Murfreesboro. The following areas are anticipated to be near capacity: between SR 1312 (Taylor Road) and the Western Corporate Limits of Jackson, between the Eastern Corporate Limits of Jackson and NC 305, and between the Western Corporate Limits of Conway and Garris Street.

US 158 is part of the Intrastate system and is listed as a facility that needs improvement; therefore, it is planned to be widened to a four-lane facility. It is anticipated that the widening and subsequent rerouting of US 158 will alleviate all expected capacity problems on existing US 158.

Two options were considered for improvement of US 158: widening the existing US 158 or locating the four-lane section on new location. Due to development along existing US 158, widening would be very disruptive and expensive, so this option was eliminated where possible.

It is recommended that a four-lane partially access controlled facility should connect at US 301 just south of Washington Avenue (SR 1651) in Halifax County. Proposed US 158 then should cross the Roanoke River at a new location east of the existing US 158 bridge, and run

south of Garysburg. It should connect to existing US 158 just south of SR 1311 (Jackson Bypass Road)/US 158 intersection with an interchange. It should then run near or on SR 1311 (on new and existing locations) and rejoin Existing US 158 where SR 1311 (Jackson Bypass Road) terminates. The corridor will then bypass Faison's Old Tavern and Conway to the south. An interchange is recommended for the proposed US 158/NC 35 intersection. Proposed US 158 will connect to the Murfreesboro Bypass near Hertford County.

One aspect of the new alignment was the possibility of relocating the proposed US 158 alignment to near SR 1311 (Jackson Bypass Road), instead of improving the existing route and constructing a bypass of Jackson. The proposed relocation is approximately 3.9 km (2.4 mi) shorter than existing US 158 that passes through Jackson. In November, 1993, the Statewide Planning Unit requested a cost comparison of the improvement of the two alternatives (widening SR 1311 and widening the existing) from the NCDOT Right-Of-Way Unit. The 1993 cost estimates for the two projects was $24.3 million for the improvement of SR 1311 (Jackson Bypass Road) and $21.6 million for widening the existing route. The estimates were based on a 91.5 km (300 ft) cross section, but the design is for a 61.0 km (200 ft) cross section. Due to the smaller cross section, property impacts will drop. Property impacts account for the higher cost to the improved SR 1311 (Jackson Bypass Road). With this information, it was assumed that both alternative were essentially equal in cost. The Statewide Planning Unit and the Northampton County Economic Development Commission agreed that the Proposed US 158 should be aligned near SR 1311 (Jackson Bypass Road), to provide for more direct east-west access.

The proposed US 158 alignment is expected to relocate seven homes and three mobile homes. Eleven homes may receive proximity damages. The proposed design minimizes impacts to farmland, traverses cut-over timber land and borders wetland areas wherever possible. Some wetlands impacts will occur, and one small gravesite will need to be relocated.

The general effect of the proposed US 158 corridor will be to free existing US 158 for local traffic. The proposed US 158 should increase speed and safety for through traffic. Since US 158 is part of the intrastate system, funding for this new location will come from the Highway Trust Fund. The preliminary cost estimate for this project is $93.5 million ($81.7 million for Northampton County portion and $11.8 million for the Garysburg Planning Area portion), in 1994 dollars. All existing sections of US 158 not incorporated into

the proposed US 158 alignment should be renamed. It is anticipated that the proposed four-lane US 158 will average 5,100 vpd (vehicles per day) in 2020.

Minor Arterials

These are the facilities that serve primarily through traffic movements in the county.

US 258 - This two-lane facility is the major north-south route in the eastern portion of the county. This route connects Rich Square, Woodland, and Murfreesboro in Hertford County.

It is anticipated that two sections of US 258 near Rich Square will be over capacity in the future year: between NC 308 and the Southern Corporate Limits of Rich Square, and between Stanford Street and NC 561 in Rich Square. Three areas are expected to be near capacity in the future year: between SR 1108 (Depot Street) and NC 308, between the Southern Corporate Limits of Rich Square and Stanford Street, and near the North Corporate Limits of Rich Square.

It is recommended that a bypass be constructed to the east of Rich Square. The two-lane facility should run near NC 305 and connect back to US 258 near the city limits. Three houses are expected to be impacted with the Rich Square Bypass.

A bypass on the eastern side of Rich Square was chosen over the western side due to the available open land on the eastern side. If the bypass was located farther east, two railroad overpasses would be required, considerably driving up the cost. A bypass on the western side of town was investigated and found to have the possibility of endangered species and commercial business impacts, and was therefore eliminated.

NC 46 - NC 46 is a major arterial linking Garysburg and the Union Camp Log Processing Industry to the lumber rich western part of Virginia. NC 46 also connects US 301 in Garysburg to I-95 and Gaston.

A part of the Garysburg Thoroughfare Plan is an eastern extension on NC 46 to connect with the proposed realignment of US 301. See the Garysburg Thoroughfare Plan for more information.

The short 0.81 km (0.50 mile) section of NC 46 between the Garysburg Planning Area and the Roanoke Rapids/ Weldon/Gaston Planning region is expected to be over

capacity in the future year. It is recommended that this route be widened to a standard 7.3 km (24 ft) section to improve safety and capacity. Any further improvements should be addressed in future updates of the Garysburg and Roanoke Rapids/Weldon/Gaston Thoroughfare Plans.

Major Collectors

The rural collector routes serve primarily intracounty travel. The major collector roads supplement the arterial system by providing an interconnecting network between smaller population centers and the arterial system.

US 301 - Historically, US 301 was the major north-south route in North Carolina until I-95 opened in 1963. Outside the Garysburg Urban Area, US 301 was operating below capacity in the base year and is expected to remain so in 2020. It is also expected that I-95 in Northampton County will be approaching capacity in 2020, so some north-south traffic may shift to US 301 at peak periods, however, it is not expected to effect these sections.

US 301 has been proposed to be rerouted east of the Town of Garysburg due to expected capacity problems. See the Garysburg Thoroughfare Plan for more information.

US 301 north of Garysburg is expected to carry an average of 2,500 vpd in the year 2020.

NC 35 - NC 35 is a major north-south route linking Hertford County to Virginia. It also connects Woodland, Conway, and Severn. Three unincorporated communities are also on this route: Potecasi, Milwaukee, and Pendleton.

Currently, north-south traffic on NC 35 in Woodland must turn on US 258, travel for one block, and turn again to remain on NC 35. To allow for a free flowing movement, it is recommended that the southern portion of NC 35 in Woodland be realigned to connect to the northern portion of NC 35 in Woodland. One small business is expected to be impacted with the realignment. In August, 1995, this business appeared to be out of business.

One section of NC 35 is expected to experience capacity problems: the section between the Northern Corporate Limits of Woodland and SR 1501 (Dusty Hill Road). To improve safety and capacity, it is recommended that any substandard sections of this route be widened to 7.3 m (24 ft). Other sections are expected to remain below capacity through the design year.

NC 48 - NC 48 is a two-lane north-south route that connects Gaston with I-95, Pleasant Hill, and US 301. This roadway is expected to be adequate through the design year with an average of 4,000 vpd between the Roanoke Rapids/Weldon/Gaston Planning Area and I-95, and 1,400 vpd east of I-95. However, to improve safety and capacity of this route, it is recommended that it be widened to a 7.3 m (24 ft) cross-section.

This section of NC 48 south of NC 46 is proposed to be widened to a multi-lane curb and gutter facility due to the capacity problems. For further information, see the Roanoke Rapids/Weldon/Gaston Thoroughfare Plan.

NC 186 - NC 186 is a two-lane major arterial originating at US 301 near the center of Garysburg. The high volumes of traffic on NC 186 is attributed to the traffic going to the Union Camp processing plant and Northampton High School West, located on NC 186 just northeast of Garysburg. Only one section of NC 186 is expected to be near capacity in 2020, between the Garysburg Planning Area and Seaboard. The proposed four-lane US 158 section, located near existing SR 1311 (Jackson Bypass Road), is expected to shift some traffic from NC 186, alleviating any expected capacity problems.

The section of NC 186 between SR 1341 (Deberry's Mill Road) and the Virginia Line is currently 6.1 m (20 ft). To improve safety and capacity, it is recommended that this section be widened to 7.3 m (24 ft).

Between Garysburg and Seaboard, this route is expected to remain under capacity in the year 2020 with an average ADT of 6,200 vpd, and 2,800 vpd east of Seaboard.

NC 186 is proposed to be rerouted in the Garysburg planning area to connect to NC 46 extension. For more information, see the Garysburg Thoroughfare Plan.

NC 305 - NC 305 is a two-lane north-south facility connecting Rich Square, Jackson, and Seaboard to Hertford County. Currently, through traffic must travel through Jackson (NC 305 is common to US 158 in this section) to reach Seaboard. It is expected that several sections of NC 305 in Jackson will be over capacity by the year 2020. However, other sections of NC 305 are expected to remain below capacity through the design year.

Two options were considered to alleviate the expected capacity problems. The first option was to widen the

problem sections. The widening would be very disruptive and costly due to these sections being located in the Central Business District of Jackson. Therefore, this option was eliminated. The second option was to reroute through traffic. It is recommended that NC 305 be rerouted east of the existing US 158/NC 305 intersection, east of Jackson. The proposed NC 305 will be rerouted on existing US 158 (east of Jackson), SR 1333 (Severn High Bridge Road), and the proposed multilane US 158 until it turns north toward Seaboard (see Figure 1, page I-3). This will remove through traffic from NC 305 in Jackson. This project will require the realignment of the NC 305/Existing US 158 intersection to allow for NC 305 to be the through movement. Another aspect of the project is the widening of SR 1333 (Jackson Bypass Road) to 7.3 m (24 ft) with slight horizontal and vertical improvements to improve capacity. No homes are expected to be impacted with this project, however, there will be some wetlands impacts with the realignment of the NC 305/Existing US 158 intersection.

NC 308 - This two-lane facility originates at US 258 south of Rich Square, and connects to Roxobel and Windsor in Bertie County. It is recommended that this facility be widened to 7.3 m (24 ft) to improve safety and capacity.

SR 1209 (Theatre Road) - This two-lane facility connects Gaston to Virginia. To improve safety and capacity, it is recommended that this facility be widened to 6.7 m (22 ft).

SR 1212 (Oak Grove Church Road) - This two-lane facility connects the small, unincorporated community of Vultare to Virginia. This roadway is currently a substandard 5.5 m (16 ft) cross-section. To improve safety and capacity, it is recommended that this facility be widened to 5.5 m (18 ft).

SR 1214 (Henrico Road) - This two-lane facility connects NC 46 to Warren County and serves mainly residential and tourist traffic in the Lake Gaston area. This facility should be adequate through the design year.

Minor Collectors

The roadways serving as minor collectors collect traffic from local roads in Northampton County and carry it to a higher system facility.

SR 1108 (Depot Road) - This route is a connector between Jackson and US 258/NC 561. Two unincorporated communities, Boones Crossroads and Bryantown, are located on this route. The section of SR 1108 between Jackson and Bryantown should be adequate through the design year. The section between Bryantown and US 258 should be widened to 6.1 m (20 ft) to improve safety and capacity.

SR 1311 (Jackson Bypass Road) - This is an east-west route north of the Town of Jackson. This route is a much shorter route for east-west through traffic than the existing US 158, but since it is narrow and has poor horizontal alignment, it is not heavily used. This route is expected to have an average ADT of 1,600 vpd in 2020.

As part of the upgrading of US 158, some portions of SR 1311 will be incorporated into the new alignment of proposed US 158. Some sections of SR 1311 will remain as collector roads. See the recommendations for US 158.

SR 1351 (Vaughn Creek Road) - This route is a connector between NC 35 in Severin to Murfreesboro. To improve safety and capacity, it is recommended that this entire route be widened to 6.1 m (20 ft).

SR 1501 (Dusty Hill Road) - This route is a connector between NC 305 and NC 35 east of Jackson. To improve safety and capacity, it is recommended that this route be widened to 6.1 m (20 ft).

SR 1502 (Griffen Road) - This route is a connector between NC 305 to NC 35 in the small, unincorporated community of Potecasi. This facility should be adequate through the design year.

SR 1503 (Lasker Road) - This north-south facility is the main route through Lasker. To improve safety and capacity, it is recommended that all sections be widened to at least 6.1 km (20 ft).

SR 1504 (Corbitt Bryant Road) - The only portion of SR 1504 classified as a minor collector is the portion of between SR 1503 (Lasker Road) and SR 1505 (Central School Road), which combined form a north-south route in the county serving Lasker and a high school. This facility should be adequate through the design year.

SR 1505 (Central School Road) - This is a north-south route that connects the small, unincorporated communities of Creeksville and Edwards Crossroads with US 158. A high school is also located on this route. This facility should be efficient through the design

year.

SR 1530 (Manlo Road) - This facility connects US 258 to Hertford County. SR 1530 is one of a series of roads that leads to NC 11, south of Murfreesboro. To improve safety and capacity, it is recommended that this route be widened to 6.1 m (20 ft).

Other Recommendations

SR 1533 (Severn High Bridge Road) - The section between US 158 and SR 1311 (Jackson Bypass Road) is a mostly residential road with a 1994 ADT of 300 vpd. It is recommended that this route have horizontal and vertical alignment improvements and be widened to a 7.3 m (24 ft) section then renamed NC 305. See NC 305 recommendations.

SR 1344 (Spence Road) - This route connects the mainly residential northern portion of the County, including the unincorporated communities of Galatia and Faison's Old Tavern, to the existing US 158 and the High School located on SR 1505 (Central School Road). To allow free flow movement on SR 1344 to SR 1505, it is recommended that the intersection with existing US 158 be realigned.

Public Involvement

The Northampton County Thoroughfare Plan was officially started in June, 1993, by a meeting with the County Commissioners. Upon recommendation of the Northampton County Economic Development Commission, on March 28, 1994, preliminary findings were presented to the Northampton County Commissioners. The recommendations were presented in a Public Hearing with the County Commissioners and the public on June 20, 1994. Due to public opposition to the proposed US 158 corridor and US 258 Bypass, the Thoroughfare Plan went back to the Planning Board for more study. Much of the public opposition was from lack of information concerning housing and farmland impacts. After the Public Hearing, the Statewide Planning Unit received many letters from interested property owners requesting information about the proposed realignment of US 158, which were promptly answered.

In a discussion with the Statewide Planning Unit and Gary Brown, Northampton County Economic Development Director, it was decided on June 22, 1994 that any decision concerning the US 258 (Rich Square) Bypass should be left up to the Town of Rich Square. Two options were available for Rich Square, agree with the proposed bypass and be included on the Northampton County Plan or request a separate thoroughfare study to be handled like Garysburg. On August 4, 1994, a

public hearing was held in Rich Square concerning the proposed US 258 Bypass. On September 8, 1994, the Rich Square Town Board decided to adopt the bypass and be incorporated with the Northampton County Thoroughfare Plan.

On May 25, 1995, a slightly revised Thoroughfare Plan was presented to the Northampton County Commissioners for review. The Proposed Thoroughfare Plan, drawn on tax mapping, was also on public display in the Northampton County Land Records Office. On July 12, 1995, a six hour drop in session was held for the public to discuss findings on a individual basis. On July 17, 1995, a second Public Hearing was held. Several members of the public were against the Thoroughfare Plan, mainly the Proposed US 158 corridor, possibly because they were impacted in some way.

The Northampton County Commissioners decided to adopt the proposed Thoroughfare Plan on August 21, 1995. The North Carolina Board of Transportation adopted the plan on October 5, 1995.

Chapter 4

ANALYSIS OF NORTHAMPTON COUNTY'S ROADWAY SYSTEM

This chapter presents an analysis of the ability of the existing street system to serve the area's travel desires. Emphasis is placed not only on detecting the deficiencies, but on understanding their cause. Travel deficiencies may be localized and the result of substandard highway design, inadequate pavement width, or intersection controls. Alternately, the underlying problem may be caused by the system deficiency such as a need for a bypass, loop facility, construction or missing links, or additional radials.

Current Thoroughfare Plans for Northampton County

Thoroughfare plans are a tool to aid officials in the development of an appropriate street system. It is important that the communities within a County, and County officials cooperate as a team in the development of this transportation system. Plan development and implementation jointly undertaken will help ensure the development of an efficient system for travel throughout the County. The following thoroughfare studies have been recently completed for Northampton County:

1. Garysburg - adopted March, 1994. Developed concurrently with the Northampton County Thoroughfare plan, and contains a section of the proposed US 158.

2. Roanoke Rapids/Weldon/Gaston - adopted October, 1992. Only the Gaston portion of the planning area is located in Northampton County.

3. Murfreesboro - adopted April, 1992. Murfreesboro is located in Hertford county, but a portion of the Murfreesboro planning area overlaps the eastern part of the Northampton County to include the Murfreesboro Bypass, which joins proposed US 158.

Transportation Improvement Program Projects

As covered in Chapter 3, the Transportation Improvement Program (TIP) is a seven year project planning document that lists the major transportation improvement projects that the Department of Transportation has planned. These projects include not only roadway projects, but also bridge projects, railroad crossings, bicycle facilities, and public transportation. Northampton County has several roadway projects identified in the 1995-2001 TIP, these projects are listed below:

1. I-95, south of US 158 to Virginia State Line. Safety Improvements, pavement and bridge rehabilitation over the Roanoke River Overflow

2. US 158, Multilanes east of Weldon to Murfreesboro Bypass. Widen Roadway to a multilane facility.

3. NC 46, NC 48 in Gaston, widen to a multilane curb and gutter facility.

4. NC 48, Roanoke Rapids to NC 46 in Gaston. Widen roadway to a multilane curb and gutter facility.

Existing Travel Patterns and Deficiencies

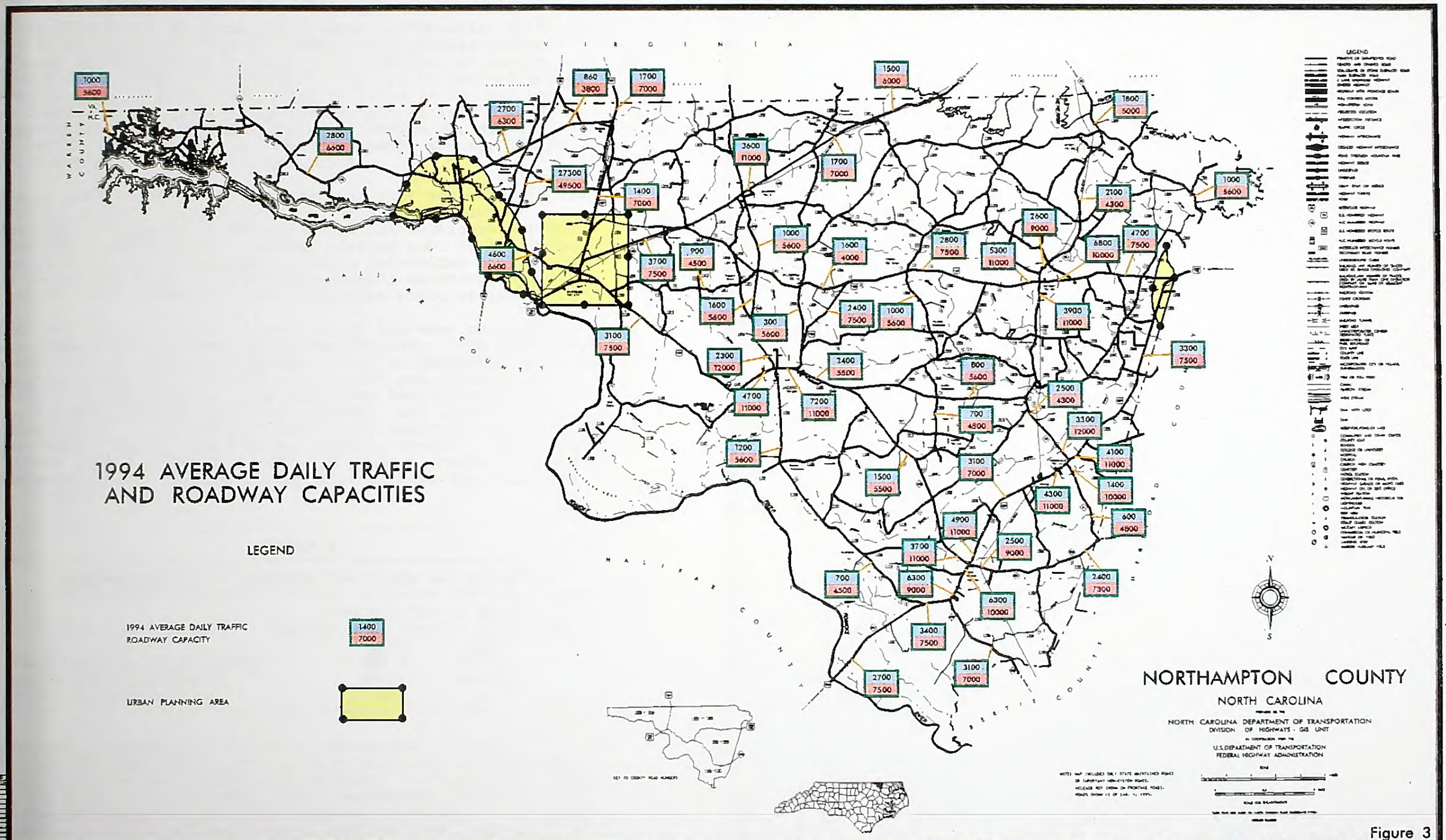
The existing roadway system in Northampton County is controlled by the topography of the area. In many instances, the roads run around or through wetland areas. The entire southern and western portion of the County is bounded by Roanoke River. Only four bridges cross the river, making entering the County difficult. Three of those bridges are located in the western part of the County (NC 48, I-95, NC 158), and the remaining bridge (US 258) is the only crossing in the eastern part of the County.

Northampton County contains several small towns: Jackson, Rich Square, Conway, Woodland, Severn, Lasker, and Seaboard. (Garysburg and Gaston are covered in separate thoroughfare studies). Most of these towns have a major route going through its downtown area, with no bypass facilities. Therefore, through traffic is forced to travel in these downtown areas. Many of these towns were built near railroad areas, making traffic circulation more difficult. Also, all of these towns are near wetlands areas. If a bypass of an area is considered, the railroad crossings will require an overpass and wetland areas impacts should be considered.

The major north-south route in Northampton County is I-95, which serves only the western portion of the county. The other major north-south routes are US 258, US 301, and NC 305. The major east-west route is US 158. US 158 is an Intrastate System Highway, therefore money has been appropriated to widen it to a four-lane facility.

Traffic Demand

Travel demand is generally reported in the form of average daily traffic counts. Traffic counts are taken regularly at several locations in Northampton County by the North Carolina Department of Transportation. The 1994 average daily traffic compared with capacity is shown in Figure 3.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AND ROADWAY CAPACITIES
LEGEND
1994 AVERAGE DAILY TRAFFIC
ROADWAY CAPACITY
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7000
URBAN PLANNING AREA
VIRGINIA
WARREN COUNTY
VA.
N.C.
HALIFAX COUNTY
NORTHAMPTON COUNTY
7000
5600
2800
6600
2700
6300
860
3800
1700
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27300
49500
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NORTHAMPTON COUNTY
NORTH CAROLINA
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS - GIS UNIT
U.S.DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

Figure 3

Width and Alignment Deficiencies

North Carolina's standard for highway construction calls for 3.4 m (11 ft) lanes on all highways with traffic volumes greater than 2000 ADT (average daily traffic) or design speeds greater than 50 miles per hour, including all primary arterials. A minimum lane width of 2.7 m (9 ft) can be tolerated on collector roads with an ADT of less than 400 vehicles per day. Minimum level of service for minor collector roads dictate a 25 km/h (40 mph) average travel speed during peak traffic conditions.

Design requirements for thoroughfares vary according to the desired capacity and level of services to be provided. Universal standards in the design of thoroughfares are not practical. Each road or highway section must be individually analyzed and its design requirements determined on the basis of amount and type of projected traffic, existing capacity, desired level of service, and available right-of-way.

The level of service is a function of the ease of movement experienced by motorists using the facility. The ability of a motorist to drive at a desired speed is dependant upon the physical design of the road, the amount and character of traffic control devices, the influence and character of traffic generated by abutting property, and imposed speed restrictions. The level of service is generally indicated by the overall travel speed experienced by traffic. Recommended minimum levels of services for roads and highways included in the proposed Northampton County Thoroughfare Plan are given in Table 5.

Table 5

Minimum Levels of Service For Roads and Highways

Facility	Overall Travel Speed During Peak Traffic Conditions	
	km/h	mph
Major and Minor Arterials	31-34	50-55
Major Collector Roads	28-31	45-50
Minor Collector Roads	25	40

From the standpoint of driver's convenience, ease of operations, and safety, it would be desirable to widen all existing roads and highways to provides a minimum lane width of 3.6 m (12 ft). However, when considering overall statewide needs and available highway revenues, it is found that these levels of improvement applied statewide would be impractical. It is necessary, therefore, to establish minimum tolerable widths for existing roads with respect to traffic demands which would be economically feasible. Table

6 gives the widths used in determining the existing lane deficiencies in the County.

Table 6

Minimum Tolerable Lane Widths

ADT	Principal Arterials (m)	(ft)	Minor Arterials (m)	(ft)	Collectors (m)	(ft)
Over 2000	3.4	11	3.4	11	3.4	11
400 - 2000	--		3.0	10	3.0	10
100 - 400	--		3.0	10	2.7	9
Below 100	--		--		2.7	9

An analysis of roadways in the Northampton County planning area was made to determine if the projected traffic (year 2020) would exceed the practical capacity of the system.

There are a number of roads in the Northampton County Planning Area that have or are expected to have substandard widths. Because of the substantial cost of upgrading all secondary roads to standard, narrow widths may have to be tolerated until sufficient funds are available to provide for improvements. The roads identified as a part of Northampton County's Thoroughfare Plan Study are listed below:

* NC 35: Hertford Co. - SCL Woodland, NCL Woodland -SCL Conway, NCL Conway - Virginia Line
* NC 46: WPB Garysburg - EPB Gaston, WPB Gaston -Virginia
* NC 48: I-95 - US 301
* NC 186: WCL Seaboard - Width Change, SR 1341 - Virginia
* NC 305: NCL Jackson - SR 1311, SCL Seaboard - Church St.
* SR 1108: US 158 - SCL Jackson, SR 1117 - NC 561
* SR 1209: NPB Gaston - Virginia Line
* SR 1211: SR 1212 - Virginia Line
* SR 1212: NC 46 - SR 1211
* SR 1351: NC 35 - SR 1355
* SR 1501: NC 305 - NC 35
* SR 1503: NC 305 - SR 1501
* SR 1530: US 258 - Hertford County

When funds are available for widening the following priority is recommended:

1) NC 35
2) NC 305
3) NC 186
4) NC 48

Capacity Analysis of the Existing System

An indication of the adequacy of the existing major street system is a comparison of the traffic volumes with the ability of the streets to move traffic freely at a desirable speed. The ability of a street to move traffic freely, safely, and efficiently with a minimum delay is controlled primarily by the spacing of major devices utilized. Thus, the ability of a street to move traffic can be increased by restricting parking and turning movements, using proper sign and signal devices, and by the application of other traffic engineering techniques.

Capacity is the maximum number of vehicles that has a reasonable expectation of passing over a given section of a roadway in one direction, or in both directions, during a given period under prevailing roadway and traffic conditions.[1] The relationship of traffic volumes to the capacity of the roadway will determine **level of service** being provided. Six levels of service have been selected for analysis purposes. They are given letter designations from A to F. Level-of-service (LOS) A represents the best operating conditions and level-of-service F the worst.

The six levels of service are illustrated in Figure 4, and they are defined on the following pages. The definitions are general and conceptual in nature, but may be applied to urban arterial levels of service. Levels of service for interrupted flow facilities vary widely in terms of both the user's perception of service quality and the operational variables used to describe them. The 1994 Highway Capacity Manual contains more detailed descriptions of the levels of service as defined for each facility type.

1994 Traffic Capacity Analysis

Figure 3 depicts the base year (1994) major street system and the **ADT** (Average Daily Traffic). A comparison of the base year ADT to capacities lists did not reveal any roadways near or over practical capacity (LOS D).

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[1] Highway Capacity Manual, Special Report 209, 1-4, 1994

Table 7
Level of Service

LOS A - describes primarily free flow-operations at average travel speeds usually about 90 percent of the free-flow speed for the arterial class. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Stopped delay at signalized intersections is minimal.

LOS B - represents reasonable unimpeded operations at average travel speeds usually about 70 percent of the free-flow speed for the arterial class. The ability to maneuver within the traffic stream is only slightly restricted and stopped delays are not bothersome. Drivers are not generally subjected to appreciable tension.

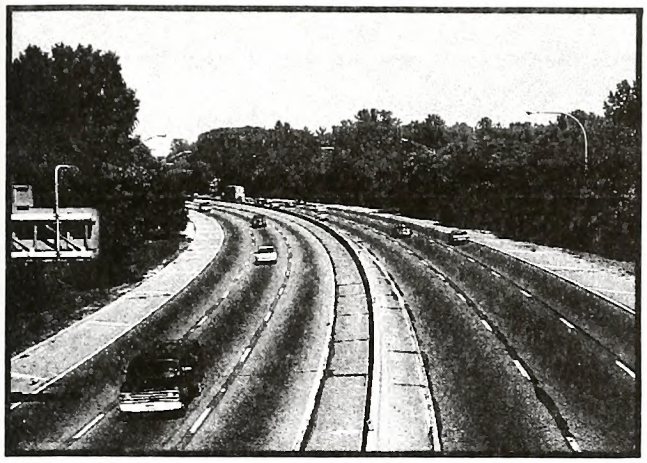
LOS C - represents stable operations. However, ability to maneuver and change lanes in mid-block locations may be more restricted than in LOS B, and longer queues and/or adverse signal coordinations may contribute to lower average travel speeds of about 50 percent of the average free-flow speed for the arterial class. Motorists will experience an appreciable tension while driving.

LOS D - borders on a range on which small increases in flow may cause substantial increases in approach delay and, hence, decreases in arterial speed. Delay may be due to adverse signal progression, inappropriate signal timing, high volumes, or some combination of these. Average travel speeds are about 40 percent of free-flow speed.

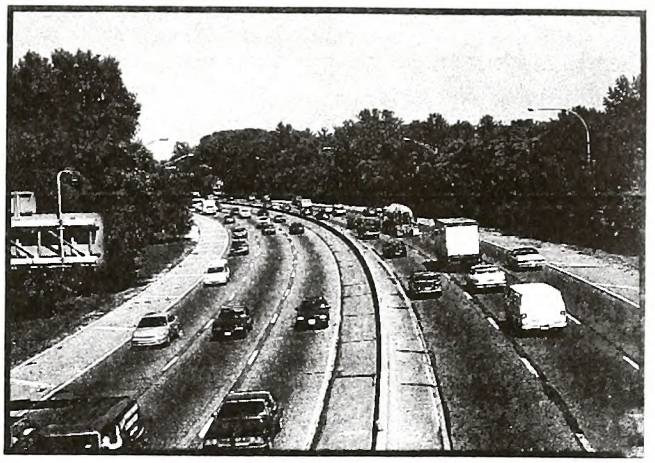
LOS E - The boundary between LOS D and LOS E describes operation at **capacity.** Operations at this level are extremely unstable, because there are virtually no gaps in the traffic stream. Any disruption to the traffic stream, such as a vehicle entering from a ramp, or changing lanes, requires the following vehicles to give way to admit the vehicle. This condition establishes a disruption wave which propagates through the upstream traffic flow. At capacity, the traffic stream has no ability to dissipate any disruption. Any incident can be expected to produce a serious breakdown with extensive queuing.

LOS F - describes forced or breakdown flow. The arterial flow is at extremely low speeds - below one-third to one-quarter of the free-flow speed. Intersection congestion is likely at critical signalized locations, with high approach delays resulting. Adverse progression is frequently a contributor to this condition.

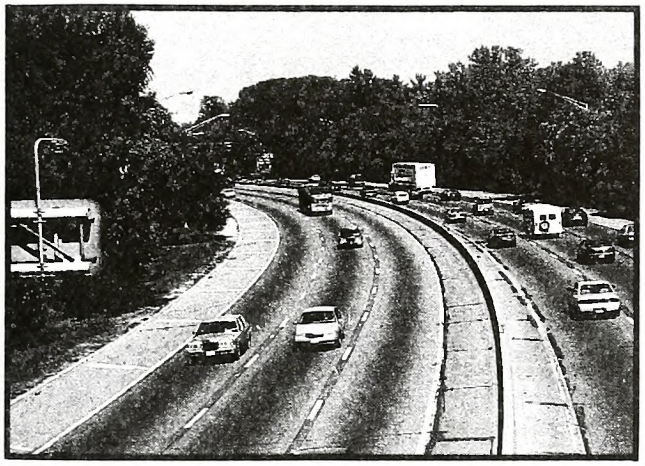
Source: 1994 Highway Capacity Manual



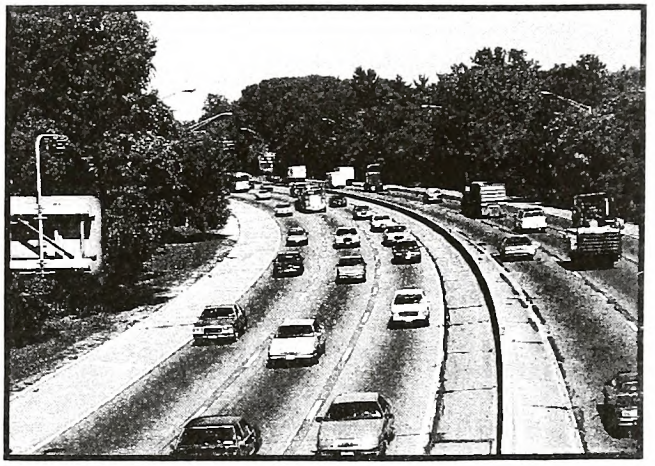
LOS A.



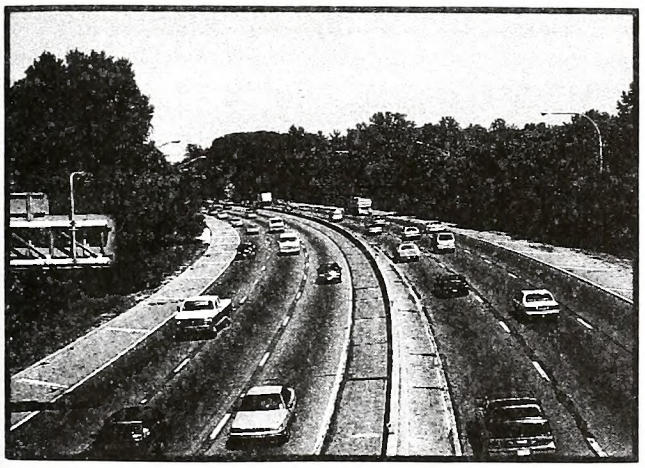
LOS D.



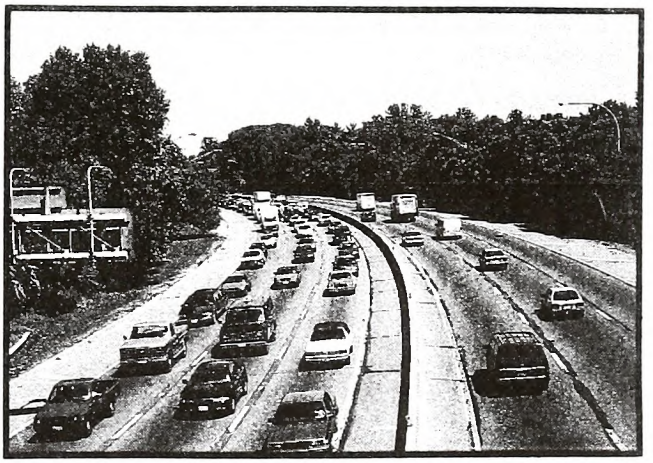
LOS B.



LOS E.



LOS C.



LOS F.

FIGURE 4

LEVELS OF SERVICE

Traffic Accidents

High Accident Locations are very important to a Thoroughfare Plan. Traffic accident records are of assistance in defining problem areas and often pinpoint a deficiency such as poor design, inadequate signing, ineffective parking, or poor sight distance. Accident patterns developed from analysis of accident data can lead to remedial action reducing the number of accidents.

Both the severity and number of accidents should be considered when investigating accident data. The severity of every accident is measured with a series of weighting factors developed by NCDOT's Division of Highways. In terms of these factors, a fatal or incapacitating accident is 47.7 times more severe than one involving only property damage. An accident resulting in minor injury is 11.8 times more severe than one with only property damage. Table 8 is a summary of accidents in Northampton County Planning Area from 1/1/90 to 12/31/93.

The "Total" column indicates the total number of accidents reported within one hundred (100) feet of the intersection during the indicated time period. The severity listed is the average accident severity for that location.

Table 8

Accident Summary 01/01/90 to 12/31/93

	LOCATION	TOTAL	SEVERITY
1.	I-95 and NC 46	10	8.24
2.	I-95 and NC 48	8	10.05
3.	US 258 and NC 308	7	24.17
4.	US 301 and SR 1239	6	13.07
5.	NC 46 and SR 1200	5	20.84
6.	NC 46 and SR 1212	5	20.84

As a part of this study, these accident locations were reviewed by the Statewide Planning Unit. None of these intersections warranted any improvements. To request a more detailed analysis for any of the above intersections, the County should contact the Division 1 Traffic Engineer.

Existing Bridge Conditions

Bridges are a vital and unique element of a highway system. First, they represent the highest unit investment of all elements of the system. Second, any inadequacy or deficiency

in a bridge reduces the value of the total investment. Third, a bridge presents the greatest opportunity of all potential highway failures for disruption of community welfare. Finally, a bridge represents the greatest opportunity of for loss of life. For these reasons, it is imperative that bridges be constructed to the same design standards as the system of which they are a part.

Congress enacted the National Bridge Inspection Program Standards on April 27, 1971, implementing the Federal Highway Act of 1968. These standards require that "all structures designed as bridges located on any of the Federal-Aid Highway Systems be inspected and the safe load carrying capacity computed at regular intervals, not to exceed two years." A sufficiency index number has been calculated for each bridge to establish eligibility and priority for replacement. The bridges with the highest priority are replaced as Federal-Aid Funds and State Funds become available.

The North Carolina DOT's Bridge Maintenance Unit, with assistance from various consultants, inspect all bridges on the State Highway System. All the bridges in Northampton County have been analyzed, rated, and inventoried. The resulting data has been reduced to a more readily usable form as a management tool.

A sufficiency rating was used in the analysis to determine the deficiency of each bridge. The sufficiency rating is a method of evaluating factors that determine whether a bridge is sufficient to remain in service. Factors used include: structural adequacy and safety, serviceability and functional obsolescence, essentially for public use, type of structure, traffic safety features.

Deficient bridges are categorized as either functionally obsolete or structurally deficient. Bridges in the functionally obsolete category have below average ratings in approach roadway alignment, under clearance, deck geometry, waterway adequacy, or structural condition. Structurally deficient bridges have below average ratings in deck superstructure, substructure, overall structural condition, or waterway adequacy. Table 9 shows the functionally obsolete bridges in Northampton County. Table 10 shows the structurally deficient bridges in Northampton County.

Table 9			
Functionally Obsolete Bridges in Northampton County			
Bridge No.	Facility Carried	Location	Rating
12	SR 1344	0.8 Mi. N. Jct. SR 1343	56.2
17	SR 1508	1.8 Mi. E. Jct. SR 1500	70.0
28	SR 1119	0.5 Mi. E. Jct. SR 1120	60.2
33	NC 305	0.4 Mi. N. Jct. SR 1520	51.5
39	NC 305	0.5 Mi. N. Jct. SR 1520	51.0
40	SR 1362	0.3 Mi. N. Jct. SR 1364	48.1
43	NC 48	0.6 Mi. N. Jct. SR 1200	86.5
55	SR 1202	0.5 Mi. E. Jct. SR 1200	84.8
70	SR 1201	0.5 Mi. E. Jct. SR 1200	82.7
72	US 258	2.1 Mi. S. Jct. SR 1108	47.7
74	US 258	0.2 Mi. S. Jct. SR 1107	47.7
76	US 258	0.8 Mi. S. Jct. SR 1108	47.7

Table 10			
Structurally Deficient Bridges in Northampton County			
Bridge No.	Facility Carried	Location	Rating
13	SR 1339	2.1 Mi. N. Jct. SR 1333	54.0
15	SR 1505	0.6 Mi. S. Jct. US 158	29.6
20	SR 1504	0.3 Mi. E. Jct. SR 1503	57.2
32	SR 1101	0.5 Mi. S. Jct. NC 305	62.7
34	SR 1101	0.6 Mi. S. Jct. NC 305	41.2
53	SR 1312	0.2 Mi. N. Jct. US 158	46.3
58	SR 1201	0.8 Mi. N. Jct. NC 48	49.6
64	US 301	0.4 Mi. S. Jct. SR 1203	39.7
65	US 258	2.7 Mi. S. Jct. SR 1107	49.6
77	NC 35	1.9 Mi. N. Jct. US 158	40.0
90	SR 1324	0.35 Mi.N. Jct. SR 1320	47.2
93	SR 1203	0.1 Mi. W. Jct. US 301	33.7
109	SR 1106	2.0 Mi. S. Jct. NC 308	46.3

The following bridges are included on the current Transportation Improvement Program:

* US 301: 0.4 Mi. S. Jct. SR 1203
* US 258: 2.7 Mi. S. Jct. SR 1107
* US 258: 2.1 Mi. S. Jct. SR 1108
* US 258: 0.2 Mi. S. Jct. SR 1107
* US 258: 0.8 Mi. S. Jct. SR 1108

Future Travel Demand

Future travel demand can be forecasted by looking at past traffic trends and calculating the average annual growth rates along any particular route. Average traffic growth in Northampton County ranges from a high of 4.9% per year to a low of 1.0% per year. Specifically, I-95 grew at 4.9% between 1970 and 1993, US Routes 1.2%, NC Routes 2.3%, and State Roads 1.0%. It is unusual for US Routes to grow slower than NC routes. Between 1970 and 1993, US 258 and US 301 expierenced little or slow traffic growth as the opening of I-95 in 1963 rerouted north-south traffic. As I-95 approaches capacity, we expect a slow shift back towards US 301 and US 258.

Using these past trends along with projected land uses and forecasted population growth, the transportation planner is able to forecast future travel demand and to predict where future problems may occur. For the purposes of this study, I-95 was projected to grow at 3.0%, US and NC Routes at 2.0%, and SR Routes at 1.0%. Figure 5 and Appendix A provide forecasted traffic for major and minor roads in Northampton County.

Capacity Deficient Corridors

Capacity Deficient Corridors were determined using the volume/capacity ratio (V/C), with the projected traffic over the practival capacity of the facility. A V/C ratio less than one is considered over capacity, and V/C between 0.80 and 0.99 is considered near capacity, but still tolerable. Based on this analysis, several roadways in Northampton County are anticipated to be near or over capacity by the planning year 2020. These routes are shown in red and green on Figure 6, and include:

I-95: between the Roanoke Rapids/Weldon/Gaston Planning Area and Virginia.
US 158: between SR 1368 (Atherton Street) and NC 305 (east), WCL Conway and Garris Street, NC 35 and WPB Murfreesboro,
US 258: SR 1108 - NCL Rich Square (most areas)
NC 35: NCL Woodland - SR 1501
NC 46: WPB Roanoke Rapids/Weldon/Gaston - EPB Garysburg
NC 186: WPB Garysburg - WCL Seaboard

Traffic congestion on these routes can be alleviated by widening or rerouting as discussed in Chapter 2.

Figure 5 shows the existing system assuming that no improvements are made by the design year. Figure 6 shows areas shows the Northampton County Areas expected to be over and near capacity in 2020.

System Deficiencies

System Deficiencies result from a lack of a cohesive, continuous, and complimentary major street network. More simply put, a system deficiency exists when drivers must go out of their way to get from point A to point B, or when the path for getting there is not cohesive or continuous.

The thoroughfare plan study identified a system deficiency for traffic traveling east-west on US 158. As discussed in Chapter 2, the improvement and relocation of portions of US 158 along segments of SR 1311 (Jackson Bypass Road) will save 3.9 km (2.4 mi) for east-west through traffic.

Intersection Deficiencies

Problems with intersection design or control can contribute to poor movement of traffic, increased traffic accidents, and driver irritation. Most of the major traffic intersections within Northampton County are located within the small urban areas throughout the County.

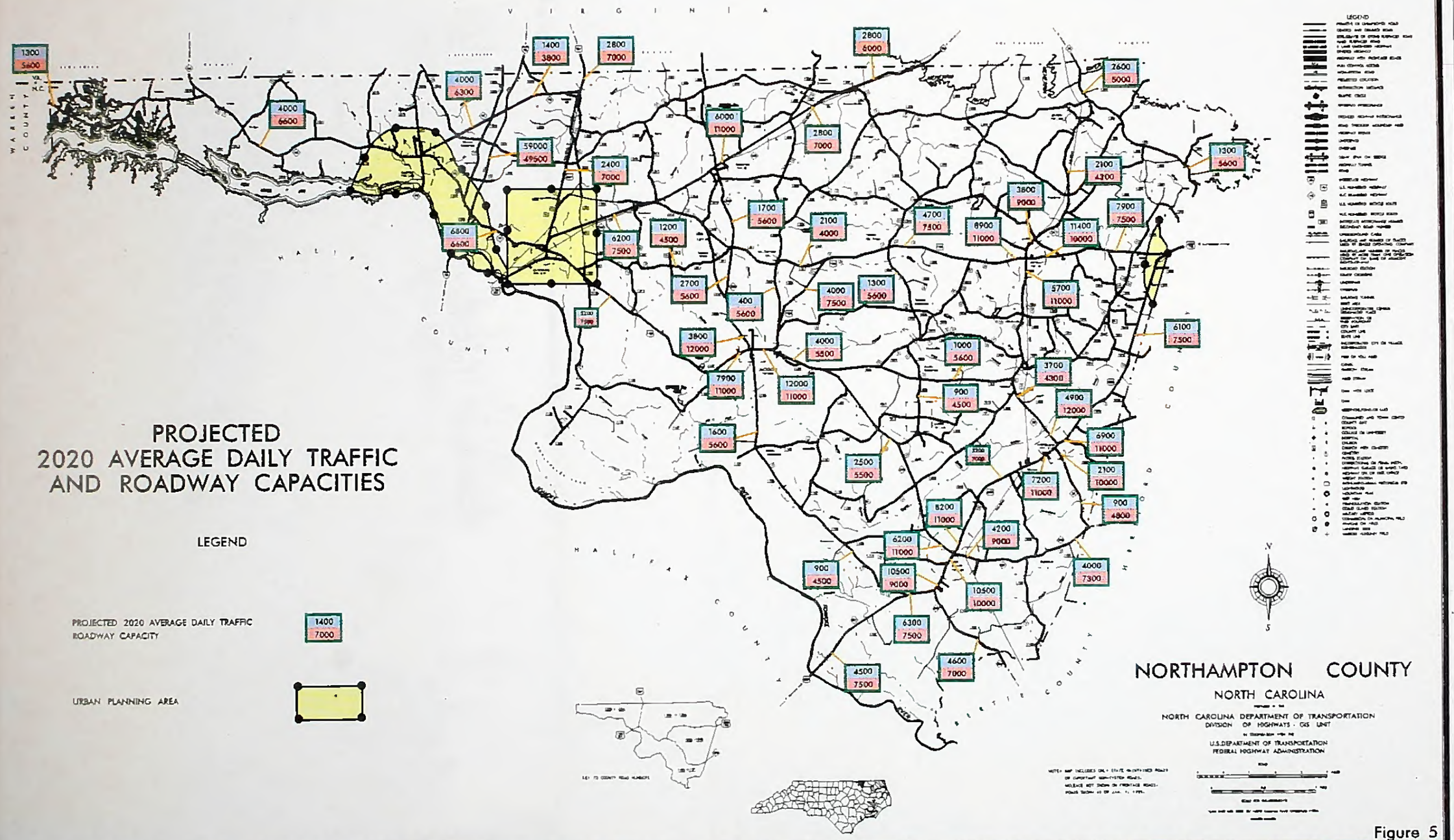
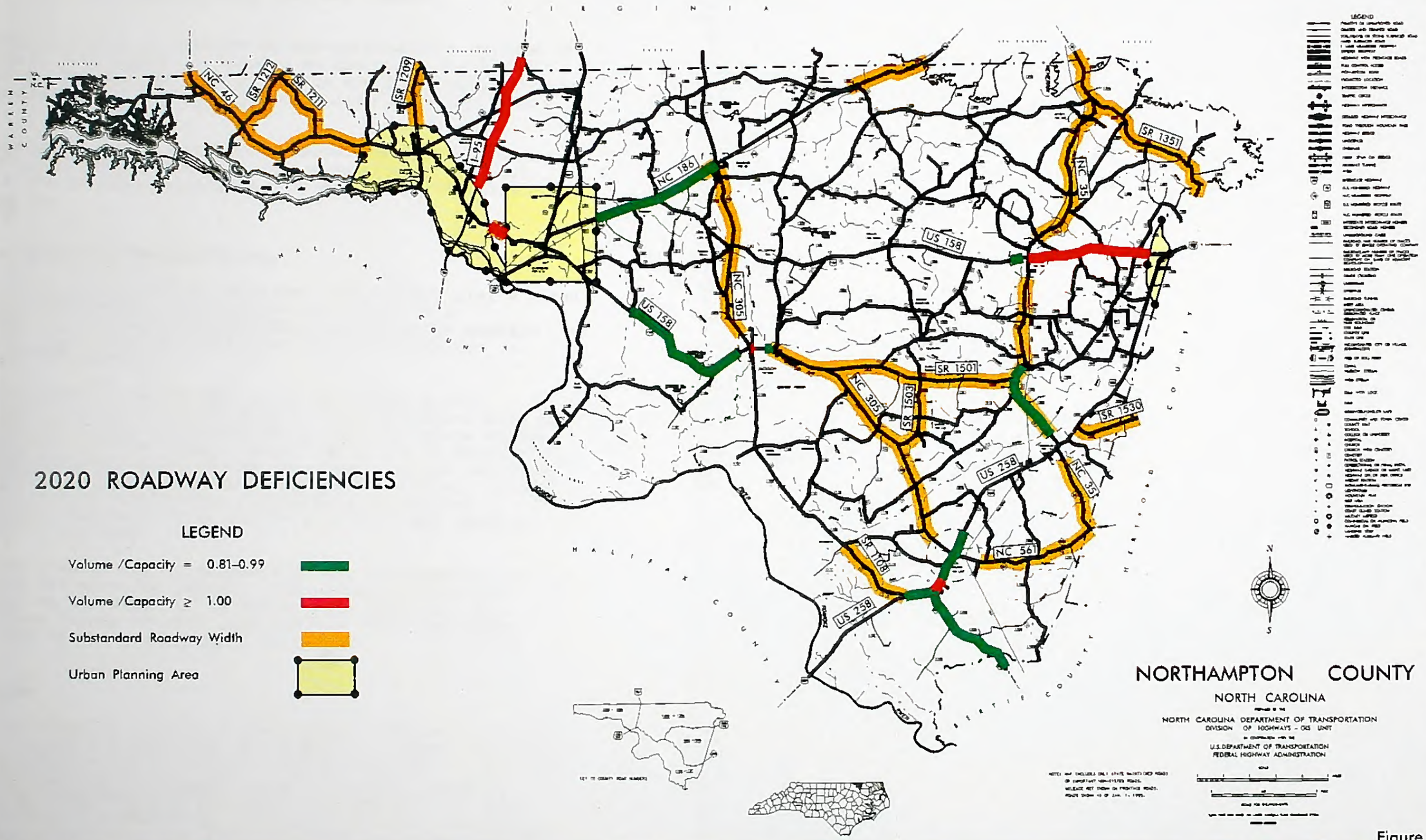

PROJECTED
2020 AVERAGE DAILY TRAFFIC
AND ROADWAY CAPACITIES
LEGEND
PROJECTED 2020 AVERAGE DAILY TRAFFIC
ROADWAY CAPACITY
1400
7000
URBAN PLANNING AREA
NORTHAMPTON COUNTY
NORTH CAROLINA
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS - GIS UNIT
U.S.DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
VIRGINIA
WARREN COUNTY
HALIFAX COUNTY
BERTIE COUNTY

Figure 5


VIRGINIA
WARREN COUNTY
NC 46
SR 1212
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I-95
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US 158
NC 305
SR 1351
NC 35
SR 1501
SR 1503
SR 1530
US 258
SR 1108
NC 561
HALIFAX COUNTY
NORTHAMPTON COUNTY
2020 ROADWAY DEFICIENCIES
LEGEND
Volume /Capacity = 0.81–0.99
Volume /Capacity ≥ 1.00
Substandard Roadway Width
Urban Planning Area
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NORTHAMPTON COUNTY
NORTH CAROLINA
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS - GIS UNIT
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

Figure 6

Chapter 5

POPULATION, LAND USE, AND TRAFFIC

Northampton County is located in the northeastern portion of the state. The county is bounded on the north by Virginia, on the west by Halifax County, on the south by Bertie County, and on the east by Hertford County. Jackson is the county seat.

Northampton County is triangular shaped and has a land area of 538 square miles, and Jackson's elevation is 131 feet. Most of the drainage is provided by the Roanoke River and its tributaries.

Factors Affecting Transportation

The factors of population, land use, and traffic play a vital role in determining the transportation needs of a municipality. Examination of these factors helps explain historic travel patterns and lays the groundwork for thoroughfare planning.

To formulate an adequate year 2020 thoroughfare plan, reliable forecasts of future travel characteristics must be achieved. The factors of population, vehicle usage trends, economy, and land use play a significant role in determining the transportation needs of the area, and must be carefully analyzed. Additional items may include the effects of legal controls such as subdivision regulations and zoning ordinances, availability of public utilities and physical features of the area.

The first step in the development of the thoroughfare plan is to define the planning period. The planning period is typically on the order of 30 years. The base year for Northampton County is 1994, and the year 2020 was chosen to be the end of the study period (26 years).

Population

Travel is directly related to population. The volume of traffic on any given section of roadway is closely related to the size and distribution of the population that it serves. Because of this relationship, one of the basic steps in planning a transportation system is an in-depth population study. Population trends for Northampton County are shown in Table 11. The population within Northampton County has been decreasing since 1970. However, with the increase of industry in the county, there is reason to believe there will be an increase in population in the study period.

Table 11	
Population Trends For Northampton County	
Year	Northampton County
1940	28,299
1950	28,432
1960	26,811
1970	24,009
1980	22,195
1990	20,798
1992	20,563
2000	21,964[1]
2010	21,283[1]
2020	21,000[2]

[1]Projections from U.S. Census - Office of State Budget and Management
[2]Projections from the Office of State Planning

Economy and Employment

One of the more important factors to be considered in estimating the future traffic growth of an area is its economic base. The number of employers and the employee's income or purchasing power influences how much population can be supported in the area and the number of motor vehicles that will be locally owned and operated. Generally, as the family income increases so does the number of vehicles owned, as well as the number of vehicles trips generated per day by each household. An accurate projection of the future economy of the area is essential to estimating future travel demand.

Northampton County suffers from a lack of growth, with agriculture the dominant source of income. In 1980, about 36% of the employed labor force were in manufacturing, 14% in professional or related services, 15% in retail trade, and 10% in agriculture. Approximately 42% of the labor force is employed in other counties.

The businesses and industries with the most employment are construction, grocery stores, health services, saw mills, car dealerships, farm supplies, and the manufacture of apparel, wood products, plastic materials, and synthetics.

Land Use

Land use refers to the physical patterns of activities and functions within the city. Nearly all traffic problems in a specific area are relative to the area's land use. The amount of traffic on a particular street is very closely related to its adjacent land use. For example, a large industrial plant might be the cause of congestion during shift change hours as its workers come and go. However, during the remainder of the day little, if any, problems might occur. The spatial distribution of different types of land use (sometimes referred to as traffic generators) is the predominant determinant of when, where, and why congestion occurs. The attraction between different land uses and their association with travel varies depending on the size, type, intensity, and spatial separation of each.

For use in transportation planning, land uses are grouped into four categories: (1) Residential - all land devoted to the housing of people except hotels and motels; (2) Commercial - all land devoted to retail trade including consumer and business services and offices; (3) Industrial - all land devoted to manufacturing, storage, warehousing, and transportation of products; and (4) Public - all land devoted to social, religious, educational, cultural, and political activities.

Northampton County is made up of 344,320 acres of land and is largely an agricultural area. Approximately 49% (168,717 acres) of the land was used for farming. In 1986, the County ranked first in the State for peanuts and second in cotton. Other crops produced in Northampton County are corn and soybeans. Farmland is distributed evenly throughout the County.

The County's population is distributed fairly evenly within the county and concentrated in towns and communities that are located along the main transportation routes. The towns of Gaston, Garysburg, Jackson, Rich Square, Woodland, Conway, Severn are all located on a major route. Only Lasker is not on a major route, but has the smallest population (96 persons).

Chapter 6

ENVIRONMENTAL CONCERNS

In the past several years, environmental considerations associated with highway construction have come to the forefront of the planning process. The legislation that dictates the necessary procedures regarding environmental impacts is the National Environmental Policy Act. Section 102 of this act requires the execution of an environmental impact statement, or EIS, for road projects that have a significant impact on the environment. Included in an EIS would be the project's impact on wetlands, water quality, historic properties, wildlife, and public lands. While this report does not cover the environmental concerns in as much detail as an EIS would, preliminary research was done on several of these factors and is included below.

Wetlands

In general terms, wetlands are lands where saturation with water is the dominant factor in determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface. The single feature that most wetlands share is soil or substrate that is at least periodically saturated with or covered by water. Water creates severe physiological problems for all plants and animals except those that are adapted for life in it or in saturated soil.

Wetlands are crucial ecosystems in our environment. They help regulate and maintain the hydrology of our rivers, lakes, and streams by slowly storing and releasing flood waters. They help maintain the quality of our water by storing nutrients, reducing sediment loads, and reducing erosion. They are also critical to fish and wildlife populations. Wetlands provide an important habitat for about one third of the plant and animal species that are federally listed as threatened or endangered.

In this study, the impacts to wetlands were determined using the National Wetlands Inventory Mapping, available from the U.S. Fish and Wildlife Service.

Wetland impacts have been avoided or minimized to the greatest extent possible while preserving the integrity of the transportation plan.

In the Northampton County slight wetland impacts will occur while widening SR 1311 (Jackson Bypass Road) to become the new four-lane US 158. Some wetlands will be destroyed to widen the existing cross-section to 61 km (200 ft). Minor

wetland areas will also need to be crossed with the proposed US 158 around Conway.

The realignment of US 301 in the Garysburg Planning Area, however, will help protect some wetland areas. The proposed US 301 (east of Existing US 301) will run near some wetland areas, thus protecting them on one side from development. In fact, some areas near this project could be converted to wetland areas to mitigate the loss of wetland areas caused by the construction of proposed US 158.

Threatened and Endangered Species

A preliminary review of the Federally Listed Threatened and Endangered Species within Northampton County was done to determine the effects that new corridors could have on the wildlife. These species were identified using mapping from the North Carolina Department of Environment, Health, and Natural Resources.

The Threatened and Endangered Species Act of 1973 allows the U. S. Fish and Wildlife Service to impose measures on the Department of Transportation to mitigate the environmental impacts of a road project on endangered plant and animals and critical wildlife habitats. By locating rare species in the planning stage of road construction, we can avoid or minimize these impacts.

There are several federally listed threatened or endangered species in the Northampton County. From a preliminary analysis, none of the proposed Northampton County projects will impact any threatened or endangered species.
A detailed field investigation is recommended prior to construction of any highway project in the county.

Historic Sites

The location of historic sites in Northampton County was investigated to determine the possible impact of the various projects studied. The federal government has issued guidelines requiring all State Transportation Departments to make special efforts to preserve historic sites. In addition, the State of North Carolina has issued its own guidelines for the preservation of historic sites. These two pieces of legislation are described below:

> National Historic Preservation Act - Section 106 of this act requires the Department of Transportation to identify historic properties listed in the National Register of Historic Places and properties eligible to be listed. The DOT must consider the impact of its road projects on these properties and consult with Federal

Advisory Council on Historic Preservation.

NC General Statue 121-12(a) - This statue requires the DOT to identify historic properties listed on the National Register, but not necessarily those eligible to be listed. DOT must consider impacts and consult with the North Carolina Historical Commission, but it is not bound by their recommendations.

There is currently only one structure in the Northampton County Planning Area that is listed on the National Register of Historic Places. It is the Gray House that was built around 1820.

This property will not be affected by the projects proposed on the thoroughfare plan. However, care should be taken to make certain that all historic sites and natural settings are preserved. Therefore, a closer study should be done to the local historic sites prior to the construction of any proposal.

Chapter 7

COUNTY THOROUGHFARE PLANNING PRINCIPLES

Purpose of Planning

There are many benefits to be gained from thoroughfare planning, but the primary objective is to assure that the road system will be progressively developed that will adequately serve future travel desires. Thus, the cardinal concept of thoroughfare planning is to make provisions for street and highway improvements so that when needs arise, feasible opportunities to make improvements exist.

Streets, roads, and highways perform two primary functions. They provide traffic service and land service. When combined, these two functions are basically incompatible. This conflict is not serious if both traffic and land service demands are low. When traffic volumes are high, however, access conflicts created by uncontrolled and intensely used abutting property result in intolerable traffic flow friction and congestion.

The major benefits derived from thoroughfare planning are:

(1) Each road or highway can be designed to perform a specific function and to provide a specific level of service. This permits savings in right-of-way, construction, and maintenance costs; protects residential neighborhoods, and encourages stability in travel and land use patterns.

(2) Local officials are informed of future improvements. Developers can design subdivisions to function in a non-conflicting manner. School and park officials can better locate their facilities. Damage to property values and community appearance that is sometimes associated with road improvements can be minimized.

County Thoroughfare Planning Concepts

The underlying concept of the thoroughfare plan is that it provides a functional system of streets, roads and highways that permit travel from origin to destinations with directness, ease, and safety. Different elements in the system are designed and called on to perform specific functions and levels of service, thus minimizing the traffic and land service conflict.

Within the County plan, elements are considered either urban or rural. In the urban planning area, the local municipality

generally has planning jurisdiction. Outside the urban planning area, the County has planning jurisdiction. In those urban areas where no urban thoroughfare plan has been developed, elements are generally considered rural and under the planning jurisdiction of the County. When a thoroughfare plan is developed for an urban area that has not previously had a plan, then the area defined by that plan would be considered urban and come under the jurisdiction of the municipality.

Within the urban and rural systems, thoroughfare plan elements are classified according to the specific function that they are to perform. A discussion of the elements and functions of the two systems follows.

Thoroughfare Classification Systems

Streets perform two primary functions, traffic service and land access, which when combined, are basically incompatible. The conflict is not serious if both traffic and land service demands are low. However, when traffic volumes are high, conflicts created by uncontrolled and intensely developed abutting property lead to intolerable traffic flow friction and congestion.

The underlying concept of the thoroughfare plan is that it provides a functional system of streets that permit travel from origins and destinations with directness, ease and safety. Different streets in this system are designed and called on to perform specific functions, thus minimizing the traffic and land service conflict.

Urban Classification

In the urban thoroughfare plan, elements are classified as major thoroughfares, minor thoroughfares, or local access streets.

Major Thoroughfares are the primary traffic arteries of the urban are providing for traffic movements within, around, and through the area.

Minor Thoroughfares collect traffic from the local access streets and carry it to the major thoroughfare system.

Local access streets have the primary purpose of providing access to abutting property. This classification may be further classified as either residential, commercial, and/or industrial depending upon the type of land use that they serve.

Due to the limited amount of detail that can be shown on a county thoroughfare plan, only urban major thoroughfares are shown.

Rural Classification

The facilities outside the urban thoroughfare planning boundaries make up the rural system. These are four major systems: principal arterials, minor arterials, major and minor collectors, and local roads. Figure 7 gives a schematic illustration of a functionally classified rural highway system.

Rural Principal Arterial System

This system is a connected network of continuous routes that serve corridor movements having substantial statewide or interstate travel characteristics. This will be shown by both the trip lengths and the travel densities. The principal arterial system should serve all urban areas of over 50,000 population and a majority of those with a population greater than 5000. The Interstate System constitutes a significant portion of the principal arterial system.

Rural Minor Arterial System

This system in conjunction with the principal arterial system forms a network that links cities, larger towns, and other major traffic generators such as large resorts. The minor arterial system generally serves interstate and intercounty travel and serves travel corridors with trip lengths and travel densities somewhat less than the principal arterial system.

Rural Collector Road System

The rural collector routes generally serve intracounty travel rather than statewide travel and constitutes those routes on which the predominant travel distances are shorter than on the arterial routes. This system is subclassified into major collector roads and minor collector roads.

Major Collector Roads

These routes provide service to the larger municipalities not directly served by the higher systems and to other traffic generators of equivalent intracounty importance, such as schools, shipping points, parks, and other important areas. Major Collector Roads also link these places with nearby larger towns or cities, or with routes of

higher classification and serve the more important intracounty travel corridors.

Minor Collector Roads

These routes collect traffic from local roads and bring all developed areas within a reasonable distance of a collector road. They also provide service to the remaining smaller communities and link the locally important traffic generators with the rural outskirts.

Rural Local Road System

The local roads comprise all roads not on one of the higher systems. Local residential subdivision streets and residential collector streets are elements of the local road system. Local residential streets are either cul-de-sacs, loop streets less than 762.2 m (2,500 ft) in length, or streets less than 1.6 km (1.0 mi) in length that do not connect thoroughfares or serve major traffic generators and do not collect traffic from more than one hundred dwelling units. Residential collector streets are streets that serve as the connecting street system between local residential streets and the thoroughfare system.

Figure 8 shows the functional classification of the major roads in Northampton County.

Objectives of Thoroughfare Planning

Thoroughfare planning is the process public officials use to assure the development of the most appropriate street system to meet the existing and future travel desires within the urban area. The primary aim of a thoroughfare plan is to guide the development of the street system in a matter consistent with changing traffic demands. Through proper planning for street development, costly errors and needless expense can be averted. A thoroughfare plan will enable street improvements to be made as traffic demand increases, and help eliminate unnecessary improvements. By developing the street system to keep pace with increasing traffic demands, a maximum utilization of the system can be attained that will require a minimum amount of land for street purposes. In addition to providing for traffic needs, the thoroughfare plan should embody those details of good urban planning necessary to present a pleasing and efficient urban community. The location of present and future population, commercial and industrial enterprises, affects major street and highway locations. Conversely, the location of major streets and highways within the urban area will influence the urban development pattern.

Other objectives of a thoroughfare plan include:

- To provide for the development of an adequate major street system as land development occurs;
- To reduce travel and transportation costs;
- To reduce the cost of major street improvements to the public through the coordination of street system with private action;
- To enable private interests to plan their actions, improvements, and development with full knowledge of public intent;
- To minimize disruption and displacement of people and business through long range planning for major street improvements;
- To reduce environmental impacts such as air pollution, resulting from transportation; and
- To increase travel safety.

These objectives are achieved through improving both the operational efficiency of thoroughfares, and improving the system efficiency by system coordination and layout.

Operational Efficiency

The operational efficiency of a street is improved by increasing the capability of the street to carry vehicular traffic and people. In terms of vehicular traffic, the capacity of a street is the maximum number of vehicles that can pass a given point on a roadway during a given period under prevailing roadway and traffic conditions. Capacity is affected by the physical features of the roadway, nature of traffic, and weather.

Physical ways to improve vehicular capacity include:

Street widening - widening a street from two to four travel lanes, the capacity of the roadway more than doubles because additional maneuverability for the traffic has been provided.

Intersection improvements - increasing the turning radii, adding exclusive turn lanes, and channelizing movements can improve the capacity of an existing intersection.

Improving vertical and horizontal alignment - reduces the congestion caused by slow moving vehicles.

Eliminating roadside obstacles - reduces side friction and improves a driver's field of sight.

Operational ways to improve street capacity include:

Control of access - a roadway with complete access control can often carry three times the traffic handled by a non-controlled access street with identical lane width and number of lanes.

Parking removal - increases capacity by providing additional street width for traffic flow and reducing friction to flow caused by parking and unparking vehicles.

One-way operation - the capacity of a street can sometimes be increased 20-50%, depending upon turning movements and street width, by initiating one-way traffic operations. One-way streets also can improve traffic flow by decreasing potential traffic conflicts and simplifying traffic signal coordination.

Reversible lanes - reversible traffic lanes may be used to increase street capacity in situations where heavy directional flows occur at peak periods.

Signal phasing and coordination - uncoordinated signals and poor signal phasing restrict traffic flow by creating excessive stop-and-go operation.

Altering travel demand is a third way to improve the efficiency of existing streets. Travel demand can be reduced or altered in the following ways:

Carpools - encourage people to form carpools and vanpools for journeys to work and other trip purposes; this reduces the number of vehicles on the roadways and raises the people carrying capability of the street system.

Alternate mode - encourage the use of alternate modes of travel such as transit, bicycles, or walking for short distance trips.

Work hours - encourage industries, business, and institutions to stagger work hours or establish variable work for employees; this will reduce travel demand in peak periods and spread peak travel over a longer period.

System Efficiency

Another means of altering travel demand is the development of a more efficient system of streets that will better serve travel desires. A more efficient system can reduce travel distances, time, and cost. Improvements in system efficiency

can be achieved through the concept of functional classification of streets and development of a coordinated major street system.

Application of Thoroughfare Planning Principles

The concepts presented in the discussion of operational efficiency, system efficiency, functional classification, and idealized major thoroughfare system are the conceptual tools available to the transportation planner in developing a thoroughfare plan. In actual practice, thoroughfare planning is done for established urban areas and is constrained by existing land use and street patterns, existing public attitudes and goals, and current expectations of future land use. Compromises must be made because of these and the many other factors that affect major street locations.

Through the thoroughfare planning process it is necessary form a practical viewpoint that certain basic principles be followed as closely as possible. These principles are listed below:

1. The plan should be derived from a thorough knowledge of today's travel - its component parts, and the factors that contribute to it, limit it, and modify it.

2. Traffic demands must be sufficient to warrant the designation and development of each major street. The thoroughfare plan should be designed to accommodate a large portion of major traffic movements on a few streets.

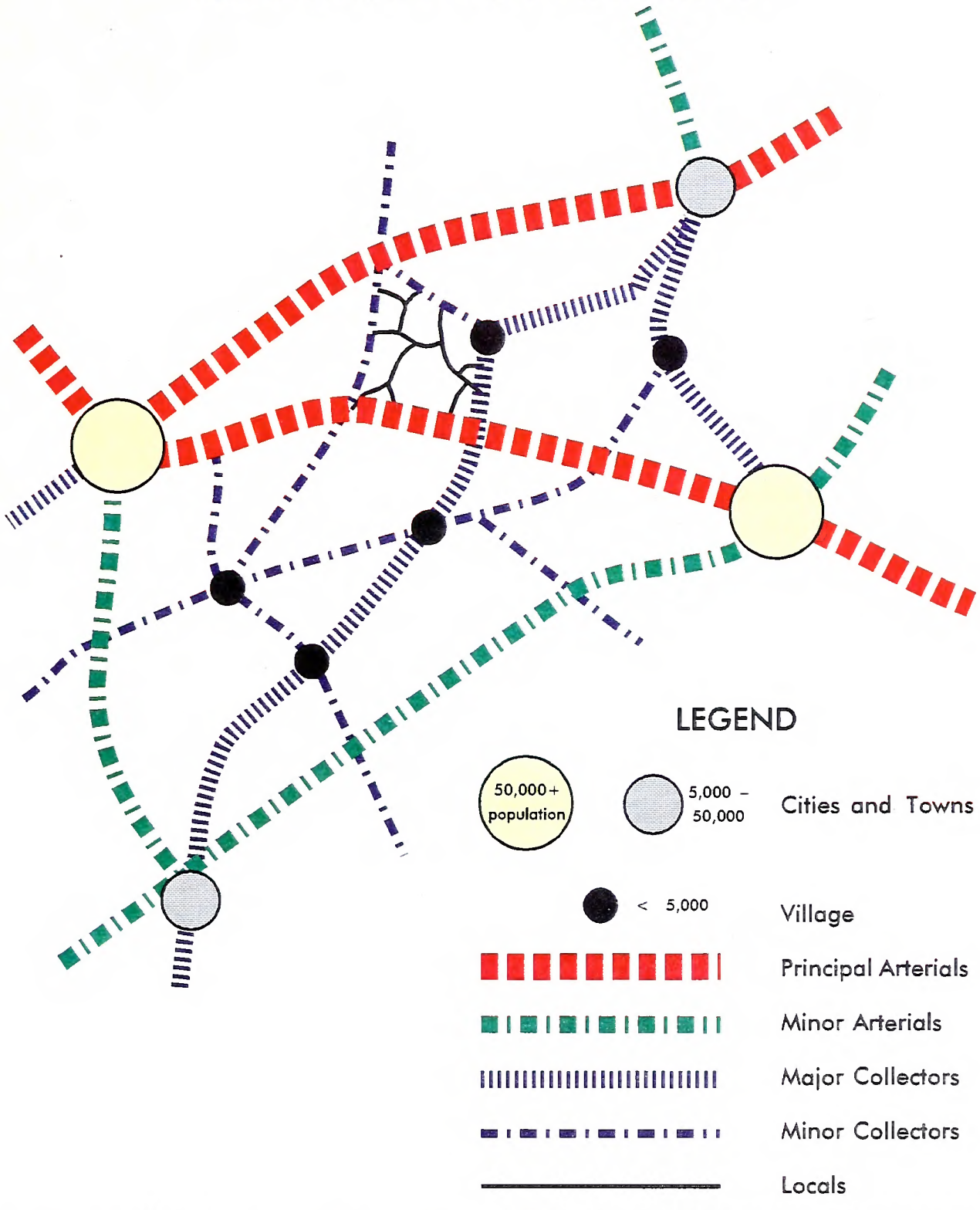
3. The plan should conform to and provide for the land development plan for the area.

4. Certain considerations must be given to urban development beyond the current planning period. Particularly in outlying or sparsely developed areas that have development potential, it is necessary to designate thoroughfares on a long range planning basis to protect right-of-way for future thoroughfare development.

5. While being consistent with the above principles and realistic in terms of travel trends, the plan must be economically feasible.

Figure 7

RURAL HIGHWAY NETWORK FUNCTIONAL CLASSIFICATION



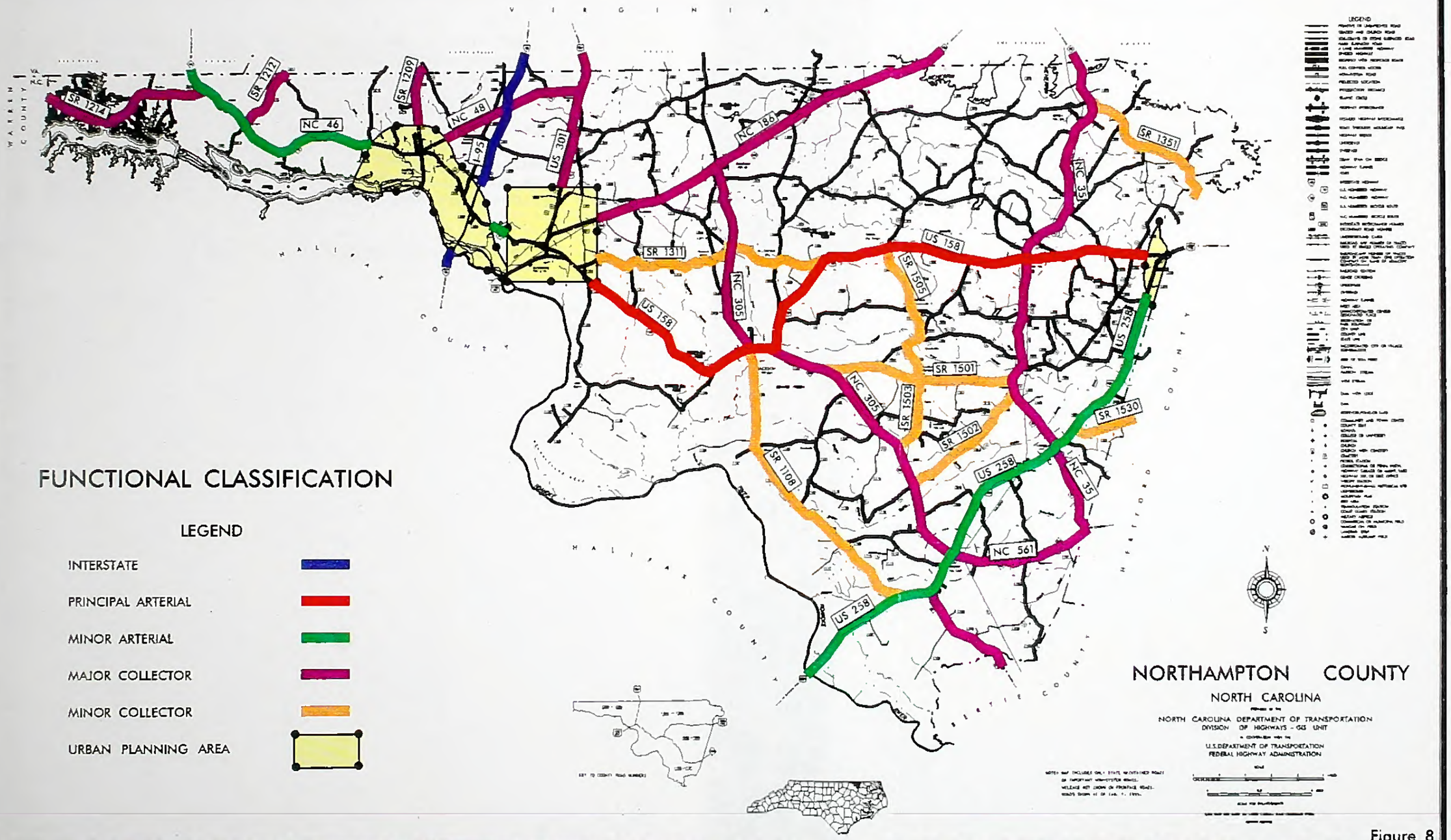

VIRGINIA
WARREN COUNTY, N.C.
HALIFAX COUNTY
NORTHAMPTON COUNTY
SR 1214
SR 1212
SR 1209
NC 46
NC 48
I-95
US 301
NC 186
SR 1311
US 158
NC 305
SR 1505
SR 1501
SR 1503
SR 1502
SR 1108
US 258
NC 35
SR 1351
SR 1530
NC 561
FUNCTIONAL CLASSIFICATION
LEGEND
INTERSTATE
PRINCIPAL ARTERIAL
MINOR ARTERIAL
MAJOR COLLECTOR
MINOR COLLECTOR
URBAN PLANNING AREA
NORTHAMPTON COUNTY
NORTH CAROLINA
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS - GIS UNIT
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

Figure 8

Appendix A

Thoroughfare Plan Street Tabulation and Recommendations

This appendix includes a detailed tabulation of all the streets identified as elements of the Northampton County Thoroughfare Plan. The table includes a description of each section, as well as the length, cross section, and right of way for each section. Also included are existing and projected average daily traffic volumes, roadway capacity, and the recommended ultimate lane configuration. Due to space constraints, these recommendations are given in the form of an alphabetic code. A detailed description of each of these alpha-codes and a illustrative figure for each can be found in Appendix C.

The following index of terms may be helpful in interpreting the table:

PB - Planning Boundary

CL - Corporate Limits

SR - State Road

ADQ - Adequate

N - North

S - South

E - East

W - West

' - Foot

REN - Rename

Appendix A

Thoroughfare Plan Street Tabulation and Recommendations

FACILITY & SECTION	EXISTING CROSS-SECTION S.I. UNITS DIST km	RDWY m	ROW m	ENGLISH UNITS DIST MI	RDY FT	ROW FT	NUMBER of LANES	PRACTICAL CAPACITY CURRENT (FUTURE)	1994 ADTS	2020 ADTS	RECOMMENDED X - SECTION RDWAY (ULT)	2020 ADTS
I-95												
Halifax County - NC 46	2.95	14.63	85.37	1.83	48	280	4	49,500	30,600	66,100	6 LANES	66100
NC 46 - NC 48	6.75	14.63	85.37	4.19	48	280	4	49,500	27,300	59,000	6 LANES	59000
NC 48 - Virginia Line	2.40	14.63	85.37	1.49	48	280	4	49,500	28,500	61,600	6 LANES	61600
US 158 (Existing Sections)												
Halifax Cty - WPB Garys	(Roanoke Rapids/Weldon/Gaston Planning Region)											
WPB Garys - ECL Garysbg	(Garysburg Planning Area)											
ECL Garys - SR 1311	(Garysburg Planning Area)											
SR 1311 - EPB Garysburg	(Garysburg Planning Area)											
EPB Garysburg - SR 1312	1.27	7.32	30.49	0.79	24	100	2	7,500	3,100	5,200	ADQ	1,200
SR 1312 - WCL Jackson	11.11	7.32	30.49	6.89	24	100	2	7,500	3,900	6,500	ADQ	2,500
WCL Jackson - NC 305	0.66	13.42	18.29	0.41	44	60	2	11,000	4,700	7,900	ADQ	3,500
NC 305 - SR 1368	0.24	14.63	18.29	0.15	48	60	2	18,000	7,200	12,000	ADQ	7,000
SR 1368 - ECL Jackson	0.76	12.20	18.29	0.47	40	60	2	11,000	7,200	12,000	ADQ	7,000
ECL Jackson - NC 305	0.35	7.32	30.49	0.22	24	100	2	9,500	4,600	7,700	ADQ	2,700
NC 305 - SR 1333	1.82	7.32	30.49	1.13	24	100	2	7,500	2,100	3,500	NEW 158	--
SR 1333 - SR 1505	9.19	7.32	30.49	5.70	24	100	2	7,500	2,400	4,000	ADQ	1,000
SR 1505 - WCL Conway	7.40	7.32	30.49	4.59	24	100	2	7,500	2,800	4,700	ADQ	1,200
WCL Conway - Garris St.	1.00	12.20	18.29	0.62	40	60	2	11,000	5,300	8,900	ADQ	5,100
Garris Street - NC 35	0.21	12.50	18.29	0.13	41	60	2	18,000	5,300	8,900	ADQ	5,100
NC 35 - ECL Conway	1.24	13.42	18.29	0.77	44	60	2	10,000	6,800	11,400	ADQ	6,400
ECL Conway - WPB Murfb	6.66	7.32	30.49	4.13	24	100	2	7,500	4,700	7,900	ADQ	2,900
WPB Murfbro - Hertford	(Murfreesboro Planning Area)											
US 158 (Proposed)												
Halifax Cty - SPB Garys	0.81	14.63	60.98	0.50	48	200	4	38,000	--	--	A	6,000
SPB Garysburg - EPB Gys	(Garysburg Planning Area)											
EPB Garysburg - NC 305	9.23	14.63	60.98	5.72	48	200	4	38,000	--	--	A	6,400
NC 305 - SR 1333	3.08	14.63	60.98	1.91	48	200	4	38,000	--	--	A	6,800
SR 1333 - Exist. US 158	3.05	14.63	60.98	1.89	48	200	4	38,000	--	--	A	4,800
Exist. US 158 - SR 1505	3.75	14.63	60.98	2.33	48	200	4	38,000	--	--	A	3,000
SR 1505 - SR 1500	5.81	14.63	60.98	3.60	48	200	4	38,000	--	--	A	3,500
SR 1500 - NC 35	3.82	14.63	60.98	2.37	48	200	4	38,000	--	--	A	4,800
NC 35 - WPB Murfreesb	7.44	14.63	60.98	4.61	48	200	4	38,000	--	--	A	5,000
WPB Murfrees - Hertford	(Murfreesboro Planning Area)											

PB - PLANNING BOUNDARY CL - CORPORATE LIMITS SR - STATE ROAD
N - NORTH S - SOUTH E - EAST W - WEST

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Thoroughfare Plan Street Tabulation and Recommendations

FACILITY & SECTION	EXISTING CROSS-SECTION S.I. UNITS DIST km	RDWY m	ROW m	ENGLISH UNITS DIST MI	RDY FT	ROW FT	NUMBER of LANES	PRACTICAL CAPACITY CURRENT (FUTURE)	1994 ADTS	2020 ADTS	RECOMMENDED X - SECTION RDWAY (ULT)	2020 ADTS
US 258												
Halifax Cty - Bridge#72	1.87	7.32	51.83	1.16	24	170	2	7,500	2,700	4,500	ADQ	4,500
Bridge #72 - SR 1108	6.10	7.32	30.49	3.78	24	100	2	7,500	2,700	4,500	ADQ	4,500
SR 1108 - NC 308	1.61	7.32	30.49	1.00	24	100	2	7,500	3,400	6,300	ADQ	6,300
NC 308 - SCL Rich Sq.	1.06	7.32	30.49	0.66	24	100	2	9,000	6,300	10,500	BYPASS	6,500
SCL Rich Sq. - Width Ch	0.35	12.20	18.29	0.22	40	60	3	13,000	6,300	10,500	BYPASS	6,500
Width Ch. - Stanford St	0.58	10.98	18.29	0.36	36	60	3	13,000	6,300	10,500	BYPASS	6,500
Stanford St. - NC 561	0.39	12.50	18.29	0.24	41	60	2	10,000	6,300	10,500	BYPASS	6,500
NC 561 - NC 305	0.11	12.50	18.29	0.07	41	60	2	18,000	6,000	10,000	BYPASS	6,000
NC 305 - Width Change	0.68	12.50	18.29	0.42	41	60	2	11,000	4,900	8,200	BYPASS	5,700
Width Change - NCL Rich	0.95	7.32	18.29	0.59	24	60	2	9,000	4,900	8,200	BYPASS	5,700
NCL Rich - WCL Woodland	6.77	7.32	30.49	4.20	24	100	2	7,000	3,100	5,200	ADQ	5,200
WCL Woodland - Width Ch	0.16	7.32	18.29	0.10	24	60	2	11,000	4,300	7,200	ADQ	7,200
Width Change - Maple St	0.63	10.37	18.29	0.39	24	60	2	11,000	4,300	7,200	ADQ	7,200
Maple Street - NC 35	0.39	12.20	18.29	0.24	40	60	2	11,000	4,300	7,200	ADQ	7,200
NC 35 - NC 35	0.27	12.20	18.29	0.17	40	60	2	18,000	4,900	8,200	ADQ	7,200
NC 35 - Lobloly Street	0.37	9.76	18.29	0.23	32	60	2	11,000	4,100	6,900	ADQ	6,900
Lobloly St. - ECL Wood	0.44	7.32	18.29	0.27	24	60	2	10,500	4,100	6,900	ADQ	6,900
ECL Wood- WPB Murfreesb	11.45	7.32	30.49	7.10	24	100	2	7,500	3,300	6,100	ADQ	6,100
WPB Murfresb - Hertford	(Murfreesboro Planning Area)											
US 258 (Rich Square Bypass - Proposed)												
NC 308 - US 258 Exist.	0.16	7.32	18.29	0.10	24	60	2	9,000	6,300	10,500	ADQ	10500
US 258 Exist. - NC 561	2.74	7.32	18.29	1.70	24	60	2	7,500	--	--	J	3,000
NC 561 - US 258 Exist.	1.45	7.32	18.29	0.90	24	60	2	7,500	--	--	J	2,500
US 258 Ex. - NCL Rich S	0.18	7.32	18.29	0.11	24	60	2	9,000	4,900	8,200	ADQ	8,200
US 301												
Halifax Cty -Gaston EPB	(Roanoke Rapids/Weldon/Gaston Planning Area)											
Gaston EPB - NPB Garysb	(Garysburg Planning Area)											
NPB Garysburg - NC 48	6.53	7.32	30.49	4.05	24	100	2	7,000	1,400	2,400	ADQ	2,400
NC 48 - Virginia Line	1.13	7.32	30.49	0.70	24	100	2	7,000	1,700	2,800	ADQ	2,400
NC 35												
Hertford Co. - SCL Wood	4.55	6.10	18.29	2.82	20	60	2	4,800	600	900	K	900
SCL Woodland - US 258	0.66	12.20	18.29	0.41	40	60	2	10,000	1,400	2,100	REROUTE	500
US 258 - US 258	(Common to US 258)											
US 258 - NCL Woodland	0.81	13.41	18.29	0.50	44	60	2	12,000	3,300	4,900	ADQ	4,900
NCL Woodland - SR 1501	5.16	6.10	18.29	3.20	20	60	2	4,300	2,500	3,700	K	3,700
	(Continued Next Page)											

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NC 35 (continued)												
SR 1501 - SCL Conway	5.76	6.10	18.29	3.57	20	60	2	4,300	1,900	2,800	K	2,800
SCL Conway - White St.	1.08	7.32	--	0.67	24	--	2	10,000	3,900	5,700	ADQ	5,700
White Street - US 158	0.15	13.72	--	0.09	45	--	2	11,000	3,900	5,700	ADQ	5,700
US 158 - Hundly Circle	0.50	12.80	--	0.31	42	--	2	11,000	2,800	4,200	ADQ	4,200
Hundly Cir. - NCL Conwy	0.79	6.10	--	0.49	20	--	2	9,000	2,600	3,800	ADQ	3,800
NCL Conway - SCL Severn	7.98	6.10	18.29	4.95	20	60	2	4,300	2,100	3,100	K	3,100
SCL Severn - NCL Severn	1.76	6.10	18.29	1.09	20	--	2	7,000	1,600	2,400	K	2,400
NCL Severn - Width Chg	1.85	6.10	18.29	1.15	20	60	2	5,000	1,800	2,600	K	2,600
Width Change - Width Cg	0.94	6.71	30.49	0.58	22	100	2	5,700	1,800	2,600	K	2,600
Width Change - Va Line	0.55	6.10	18.29	0.34	20	60	2	5,000	1,800	2,600	K	2,600
NC 35 (Realignment in Woodland)												
Hertford Co. - Exist 35	4.03	6.10	18.29	2.50	20	60	2	4,800	600	900	K	900
Exist. NC 35 - SCL Wood	0.56	7.32	30.49	0.35	24	100	2	11,000	--	1,400	K	1,400
SCL Woodland - NC 35	0.81	7.32	30.49	0.50	24	100	2	11,000	--	1,600	K	1,600
NC 46												
US 301 - WPB Garysburg	(Garysburg Planning Area)											
WPB Garysb - EPB Gaston	0.81	6.10	30.49	0.50	20	100	2	6,600	4,600	6,800	K	6,800
EPB Gaston - WPB Gaston	(Roanoke Rapids/Weldon/Gaston Planning Area)											
WPB Gaston - Va Line	13.61	6.10	18.29	8.44	20	60	2	6,600	2,800	4,100	K	4,100
NC 48												
Halifax Cty -NPB Gaston	(Roanoke Rapids/Weldon/Gaston Planning Area)											
NPB Gaston - I-95	4.42	6.71	18.29	2.74	22	60	2	6,300	2,700	4,000	K	4,000
I-95 - US 301	4.90	5.49	18.29	3.04	18	60	2	3,800	860	1,400	K	1,400
NC 186												
US 301 - EPB Garysburg	(Garysburg Planning Area)											
EPB Garysb - WCL Seabd	7.68	7.32	18.29	4.76	24	60	2	7,500	3,700	6,200	ADQ	5,700
WCL Seabd - Width Chang	0.74	6.10	--	0.46	20	--	2	9,000	3,600	6,000	K	5,500
Width Change - NC 305	0.34	13.41	--	0.21	44	--	2	11,000	3,200	5,300	ADQ	4,800
NC 305 - Width Change	0.65	12.19	--	0.40	40	--	2	11,000	3,600	6,000	ADQ	6,000
Width Chg - ECL Seabrd	0.71	7.32	--	0.44	24	--	2	10,000	3,600	6,000	ADQ	6,000
ECL Seaboard - SR 1341	8.06	7.32	18.29	5.00	24	60	2	7,000	1,700	2,800	ADQ	2,800
SR 1341 - Virginia Line	5.29	6.10	18.29	3.28	20	60	2	6,000	1,500	2,500	K	2,500

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FACILITY & SECTION	EXISTING CROSS-SECTION S.I. UNITS DIST km	RDWY m	ROW m	ENGLISH UNITS DIST MI	RDY FT	ROW FT	NUMBER of LANES	PRACTICAL CAPACITY CURRENT (FUTURE)	1994 ADTS	2020 ADTS	RECOMMENDED X - SECTION RDWAY (ULT)	ROW (ULT)
NC 305												
Hertford Co. - ECL Rich	7.47	6.71	18.29	4.63	22	60	2	7,300	2,400	4,000	K	4,000
ECL Rich Square- NC 561	1.40	6.10	--	0.87	20	--	2	9,000	2,500	4,200	ADQ	4,200
NC 561 - US 258	0.13	10.37	--	0.08	34	--	2	18,000	2,500	4,200	ADQ	2,200
US 258 - Maple Street	0.19	11.59	--	0.12	38	--	2	11,000	3,700	6,200	ADQ	6,200
Maple St. - WCL Rich Sq	1.52	6.10	--	0.94	20	--	2	9,000	3,700	6,200	ADQ	6,200
WCL Rich Sq. - SR 1502	3.55	6.71	--	2.20	22	--	2	5,500	2,400	4,000	K	4,000
SR 1502 - SR 1501	9.35	6.71	--	5.80	22	--	2	5,500	1,500	2,500	K	2,500
SR 1501 - US 158	3.39	6.71	--	2.10	22	--	2	5,500	2,400	4,000	K	4,000
US 158 - US 158	(Common to US 158)											
US 158 - NCL Jackson	0.94	10.98	--	0.58	36	--	2	12,000	2,300	3,800	REN,ADQ	2,800
NCL Jackson - SR 1311	5.97	6.10	18.29	3.70	20	60	2	5,600	1,600	2,700	REN, K	1,700
SR 1311 - SCL Seaboard	4.16	6.10	18.29	2.58	20	60	2	5,600	1,000	1,700	REN, K	2,200
SCL Seabrd - Church St.	0.55	6.10	--	0.34	20	--	2	9,000	3,200	5,300	REN, K	5,800
Church St. - RRD Cross	0.34	10.37	--	0.21	34	--	2	11,000	3,200	5,300	REN,ADQ	5,800
RRD Crossing - NC 186	0.08	7.32	--	0.05	24	--	2	11,000	3,200	5,300	REN,ADQ	5,800
NC 305 Reroute												
(See SR 1333)												
NC 308												
US 258 - Bridge	5.66	6.71	18.29	3.51	22	60	2	6,300	3,100	4,600	K	4,600
Bridge - Bertie County	0.31	10.98	18.29	0.19	36	60	2	7,000	3,100	4,600	ADQ	4,600
NC 561												
Halifax Cty - Walnut St	(Common to US 258)											
Walnut Street - NC 305	0.11	5.49	--	0.07	18	--	2	9,000	2,200	3,200	ADQ	500
NC 305 - Hertford Cty	(Common to NC 305)											
SR 1108 (Depot Road)												
US 158 - SCL Jackson	0.81	6.10	--	0.50	20	--	2	10,000	1,500	2,000	22'	2,000
SCL Jackson - SR 1131	5.32	6.10	--	3.30	20	--	2	5,600	1,200	1,600	ADQ	1,600
SR 1131 - SR 1117	8.25	6.10	--	5.10	20	--	2	5,600	700	900	ADQ	900
SR 1117 - NC 561	5.16	5.49	--	3.20	18	--	2	4,500	700	900	20'	900
SR 1209 (Theatre Road)												
NC 48 - NPB Gaston	(Roanoke Rapids/Weldon/Gaston Planning Area)											
NPB Gaston - Va Line	3.39	6.10	--	2.10	20	--	2	5,600	1,800	2,300	22'	2,300
SR 1211 (Cherry Tree Road)												
SR 1212 - Virginia Line	0.16	5.49	--	0.10	16	--	2	3,500	420	550	18'	550

PB - PLANNING BOUNDARY CL - CORPORATE LIMITS SR - STATE ROAD
N - NORTH S - SOUTH E - EAST W - WEST ADQ - ADEQUATE REN -RENAME

Appendix A

Thoroughfare Plan Street Tabulation and Recommendations

FACILITY & SECTION	EXISTING CROSS-SECTION S.I. UNITS DIST km	RDWY m	ROW m	ENGLISH UNITS DIST MI	RDY FT	ROW FT	NUMBER of LANES	PRACTICAL CAPACITY CURRENT (FUTURE)	1994 ADTS	2020 ADTS	RECOMMENDED X - SECTION RDWAY (ULT)	2020 ADTS
SR 1212 (Oak Grove Church Road)												
NC 46 - SR 1211	4.19	4.88	--	2.60	16	--	2	3,500	340	450	18'	450
SR 1214 (Henrico Road)												
NC 46 - Lake Gaston Br.	7.90	7.32	--	4.90	24	--	2	5,900	1,600	2,100	ADQ	2,100
Lake Bridge - Warren Cy	3.06	6.10	--	1.90	20	--	2	5,600	1,000	1,300	ADQ	1,300
SR 1311 (Jackson Bypass Road)												
GARYSBURG PB - SR 1314	8.63	6.10	--	5.35	20	--	2	4,500	900	1,200	NEW 158	--
SR 1314 - SR 1315	1.29	6.10	--	0.80	20	--	2	4,500	750	1,000	NEW 158	--
SR 1315 - NC 305	0.16	6.10	--	0.10	20	--	2	4,500	1,200	1,600	NEW 158	--
NC 305 - SR 1333	3.06	5.49	--	1.90	18	--	2	4,000	1,600	2,100	ADQ	200
SR 1333 - US 158	2.90	5.49	--	1.80	18	--	2	4,000	1,600	2,100	ADQ	300
SR 1333 (Severn Hi Bridge Road)/Proposed NC 305												
US 158 - SR 1311	3.87	6.10	--	2.40	20	--	2	5,600	300	400	K	3,500
SR 1351 (Vaughn Creek Road)												
NC 35 - SR 1355	8.47	5.49	--	5.25	18	--	2	4,500	1,100	1,400	20'	1,400
SR 1355 - Hertford Co.	0.56	6.10	--	0.35	20	--	2	5,600	1,000	1,300	ADQ	1,300
SR 1501 (Dusty Hill Road)												
NC 305 - NC 35	11.94	5.49	--	7.40	18	--	2	5,600	800	1,000	20'	1,000
SR 1502 (Griffen Road)												
NC 305 - SR 1514	3.23	6.10	18.29	2.00	20	60	2	5,200	340	450	ADQ	450
SR 1514 - NC 35	5.32	6.10	18.29	3.30	20	60	2	5,200	800	1,000	ADQ	1,000
SR 1503 (Lasker Road)												
NC 305 - SCL Lasker	1.61	5.49	18.29	1.00	18	60	2	4,500	800	1,000	20'	1,000
SCL Lasker - NCL Lasker	1.81	5.49	--	1.12	18	--	2	4,500	700	900	20'	900
NCL Lasker - SR 1501	1.45	5.49	--	0.90	18	--	2	4,500	700	900	20'	900
SR 1501 - SR 1504	2.26	6.10	--	1.40	20	--	2	5,600	550	700	ADQ	700
SR 1504 (Corbitt Bryant Road)												
SR 1503 - SR 1505	1.13	6.10	--	0.70	20	--	2	5,600	230	300	ADQ	300
SR 1505 (Central School Road)												
SR 1504 - SR 1500	1.61	6.10	--	1.00	20	--	2	5,600	500	650	ADQ	650
SR 1500 - US 158	4.52	6.10	--	2.80	20	--	2	5,600	1,000	1,300	ADQ	1,300
SR 1530 (Menlo Road)												
US 258 - Hertford Cty	3.06	5.49	--	1.90	18	--	2	4,500	800	1,000	20'	1,000

Appendix B

TYPICAL THOROUGHFARE CROSS SECTIONS

Cross section requirements for thoroughfares vary according to the desired capacity and level of service to be provided. Universal standards in the design of thoroughfares are not practical. Each street section must be individually analyzed and its cross section requirements determined on the basis of amount and type of projected traffic, existing capacity, desired level of service, and available right-of-way.

Typical cross section recommendations are shown in Figure B-1. These cross sections are typical for facilities on new location and where right-of-way constraints are not critical. For widening projects and urban projects with limited right-of-way, special cross sections should be developed that meet the needs of the project.

Recommended typical cross sections for thoroughfares were derived on the basis of projected traffic, existing capacities, desirable levels of service, and available right-of-way. The recommended typical cross sections for the thoroughfares are given in Appendix A along with other pertinent information.

On all existing and proposed major thoroughfares delineated on the thoroughfare plan, adequate right-of-way should be protected or acquired for the ultimate cross sections. Ultimate desirable cross sections for each thoroughfares are listed in Appendix A. Recommendations for "ultimate" cross sections are provided for the following:

(1) thoroughfares which may require widening after the current planning period

(2) thoroughfares which are borderline adequate and accelerated traffic growth could render them deficient

(3) thoroughfares where an urban curb and gutter cross section may be locally desirable because of urban development or redevelopment.

Recommended design standards relating to maximum and minimum grades, minimum sight distances, maximum degree of curve and related super elevation, and other considerations for thoroughfares are given in Appendix C. This Appendix gives definitions and design standards recommended for inclusion in subdivision regulations.

A - Four Lanes Divided with Median - Freeway

Cross section "A" is typical for controlled access freeways. The 14 m (46') grassed median is the minimum desirable median width, but there could be some variation from this depending upon design considerations. Right-of-way requirements would typically vary upward from 70 m (228') depending upon cut and fill requirements.

B - Seven Lanes - Curb and Gutter

Cross section "B" should not be used for new projects. When the conditions warrant six lanes, cross section "D" should be recommended. Cross section "B" should be used only in special situations such as when widening from a five lane section and right-of-way is limited. Even in these situations, consideration should be given to converting the center turn lane to a median so that cross section "D" is the final cross section.

C - Five Lanes - Curb and Gutter

Cross section "C" is typical for major thoroughfares where frequent left turns are anticipated as a result of abutting development or frequent street intersections.

D - Six Lanes Divided with Raised Median - Curb and Gutter
E - Four Lanes Divided with Raised Median - Curb and Gutter

Cross sections "D" and "E" are used on major thoroughfares where left turns and intersecting streets are not as frequent. Left turns would be restricted to a few selected intersections. The 4.8 m (16') median is the minimum recommended for an urban boulevard type cross section. In most instances, monolithic construction should be utilized due to greater cost effectiveness, ease and speed of placement, and reduced future maintenance requirements. In special cases, grassed or landscaped medians may be used in urban areas. However, these types of medians result in greatly increased maintenance costs and an increased danger to maintenance personnel. Non-monolithic medians should only be recommended when the above concerns are addressed.

F - Four Lanes Divided - Boulevard, Grass Median

Cross section "F" is recommended for urban boulevards or parkways to enhance the urban environment and to improve the compatibility of major thoroughfares with residential areas. A minimum median width of 7.3 m (24') is recommended with 9.1 m (30') being desirable.

G - Four Lanes - Curb and Gutter

Typical cross section "G" is recommended for major thoroughfares where projected travel indicates a need for four travel lanes but traffic is not excessively high, left turning movements are light, and right-of-way is restricted. An additional left turn lane would probably be required at major intersections. This cross section should be used only if the above criteria is met. If right-of-way is not restricted, future strip development could take place and the inner lanes could become de facto left turn lanes.

H - Three Lanes - Curb and Gutter

In urban environments, thoroughfares which are proposed to function as one-way traffic carriers would typically require cross section "H". Cross sections "I" and "J" are usually recommended for urban minor thoroughfares since these facilities usually serve both land service and traffic service functions. Cross section "J" would be used on those minor thoroughfares where parking on both sides is needed as a result of more intense development.

I - Two Lanes - Curb and Gutter, Parking Both Sides
J - Two Lanes - Curb and Gutter, Parking One Side

Cross Sections "I" and "J" are usually recommended for urban minor thoroughfares since these facilities usually serve both land service and traffic service functions. Cross Section "I" would be used on those minor thoroughfares where parking on both sides is needed as a result of more intense development.

K - Two Lanes - Paved Shoulder

This cross section is used in rural areas or for staged construction of a wider multi-lane cross section. On some thoroughfares, projected traffic volumes may indicate that two travel lanes will adequately serve travel for a considerable period of time. For area that are growing and future widening will be necessary, the full right-of-way of 30 m (100 ft) should be required. In some instances, local ordinances may not allow the full 30 m. In those cases, 21 m (70 ft) should be preserved by use of building setbacks and future street line ordinances.

L - Six Lanes Divided with Grass Median - Freeway

Cross Section "L" is typical for controlled access freeways. The 14 m (46 ft) grassed median is the minimum desirable median width, but there could be some variation from this depending upon design considerations. Right-of-way requirements would typically vary upward from 70 m (228 ft) depending on cut and fill requirements.

M - Eight Lanes Divided with Raised Median - Curb and Gutter

Also used for controlled access freeways, this cross sections may be recommended for freeways going through major urban areas or for routes projected to carry very high volumes of traffic.

N - Five Lane Roadway - Curb and Gutter, Widened Curb Lanes
O - Two Lanes - Shoulder Section
P - Four Lanes Divided with Raised Median - Curb and Gutter, Widened Curb Lanes

If there is sufficient bicycle travel along the thoroughfare to justify a bicycle lane or bikeway, additional right-of-way may be required to contain the bicycle facilities. The North Carolina Bicycle Facilities Planning and Design Guidelines should be consulted for design standards for bicycle facilities. Cross Sections "N", "O", and "P" are typically used to accommodate bicycle travel.

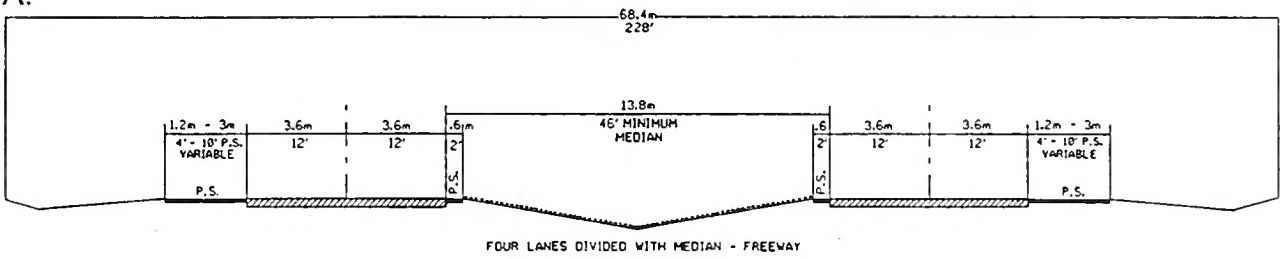
General

The urban curb and gutter cross sections all illustrate the sidewalk adjacent to the curb with a buffer or utility strip between the sidewalk and the minimum right-of-way line. This permits adequate setback for utility poles. If it is desired to move the sidewalk farther away from the street to provide additional separation for pedestrians or for aesthetic reasons, additional right-of-way must be provided to insure adequate setback for utility poles.

The right-of-ways shown for the typical cross sections are the minimum rights-of-way required to contain the street, sidewalks, utilities, and drainage facilities. Cut and fill requirements may require either additional right-of-way or construction easements. Obtaining construction easements is becoming the more common practice for urban thoroughfare construction.

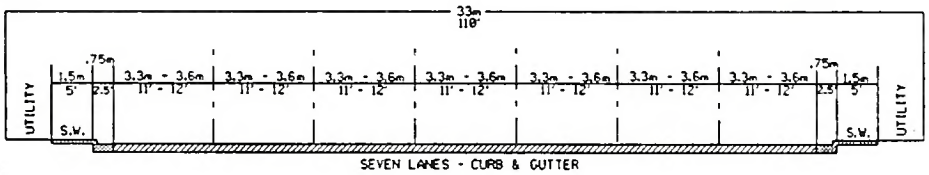
TYPICAL THOROUGHFARE CROSS SECTIONS

A.



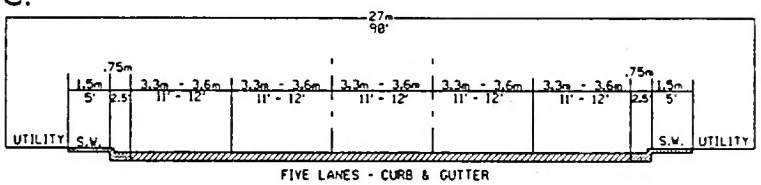
FOUR LANES DIVIDED WITH MEDIAN - FREEWAY

B.



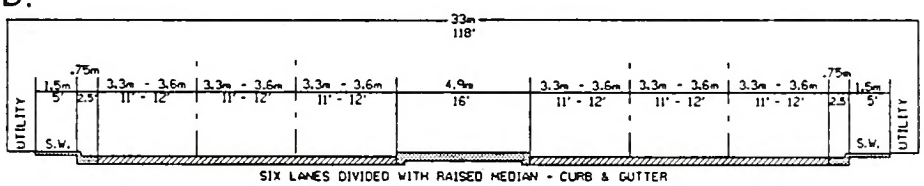
SEVEN LANES - CURB & GUTTER

C.



FIVE LANES - CURB & GUTTER

D.

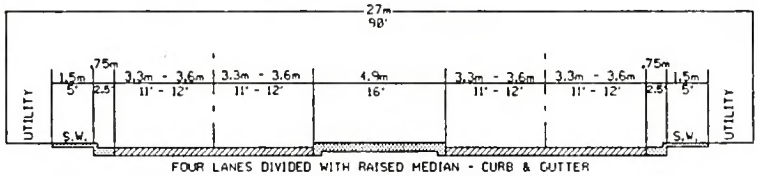


SIX LANES DIVIDED WITH RAISED MEDIAN - CURB & GUTTER

FIGURE B-1

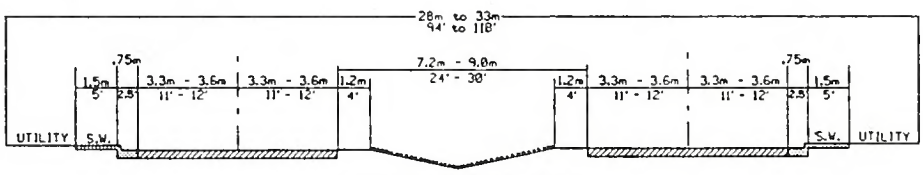
TYPICAL THOROUGHFARE CROSS SECTIONS

E.



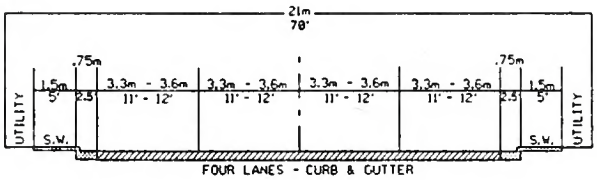
FOUR LANES DIVIDED WITH RAISED MEDIAN - CURB & GUTTER

F.



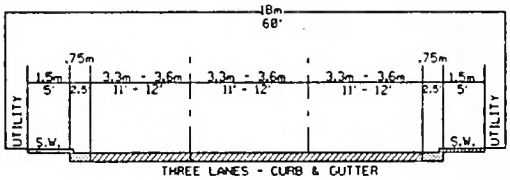
FOUR LANES DIVIDED - BOULEVARD
GRASS MEDIAN

G.



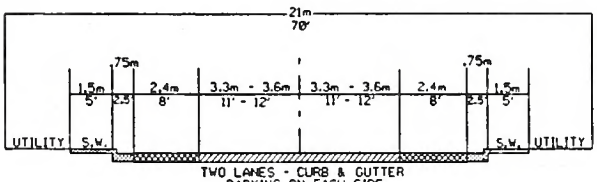
FOUR LANES - CURB & GUTTER

H.



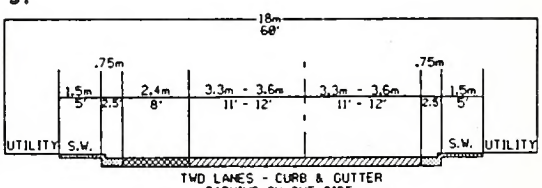
THREE LANES - CURB & GUTTER

I.



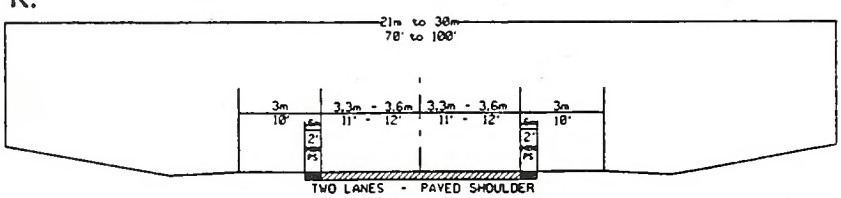
TWO LANES - CURB & GUTTER
PARKING ON EACH SIDE

J.



TWO LANES - CURB & GUTTER
PARKING ON ONE SIDE

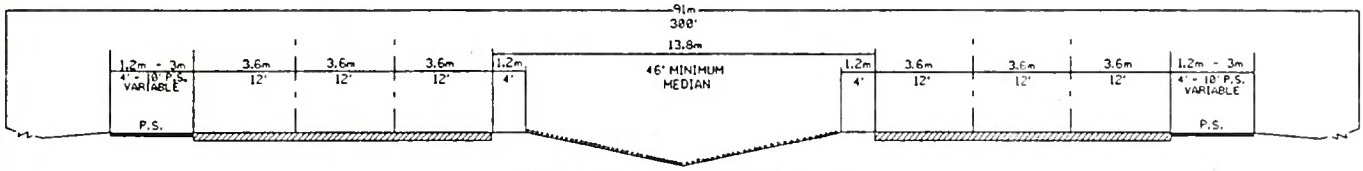
K.



TWO LANES - PAVED SHOULDER

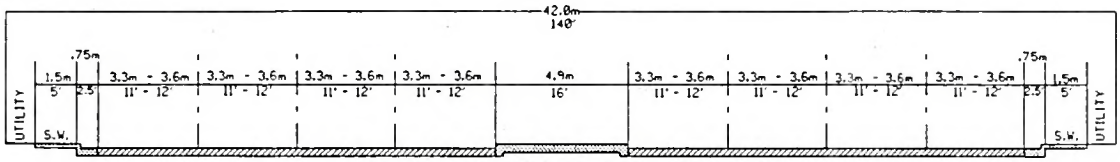
TYPICAL THOROUGHFARE CROSS SECTIONS

L.



SIX LANES DIVIDED WITH GRASS MEDIAN - FREEWAY

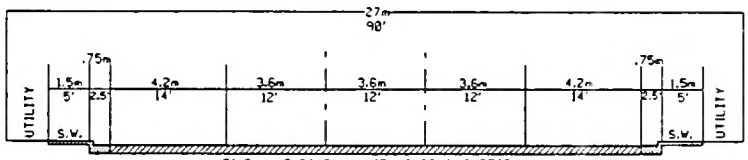
M.



EIGHT LANES DIVIDED WITH RAISED MEDIAN - CURB & GUTTER

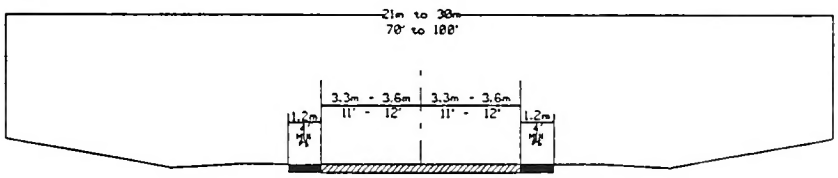
TYPICAL THOROUGHFARE CROSS SECTIONS FOR ACCOMMODATING BICYCLES

N.



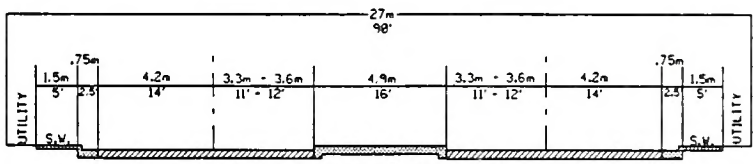
FIVE-LANE ROADWAY WITH CURB & GUTTER,
STANDARD INSIDE LANES & WIDENED CURB LANES

O.



TWO LANES - SHOULDER SECTION

P.



FOUR LANES DIVIDED WITH RAISED MEDIAN - CURB & GUTTER,
STANDARD INSIDE LANES & WIDENED CURB LANES

Appendix C

RECOMMENDED SUBDIVISION ORDINANCES[1]

DEFINITIONS

I. Streets and Roads:

A. Rural Roads

1. Principal Arterial - A rural link in a highway system serving travel, and having characteristics indicative of substantial statewide or interstate travel and existing solely to serve traffic. This network would consist of Interstate routes and other routes designated as principal arterials.

2. Minor Arterial - A rural roadway joining cities and larger towns and providing intra-state and inter-county service at relatively high overall travel speeds with minimum interference to through movement.

3. Major Collector - A road which serves major intra-county travel corridors and traffic generators and provides access to the Arterial system.

4. Minor Collector - A road which provides service to small local communities and traffic generators and provides access to the Major Collector system.

5. Local Road - A road which serves primarily to provide access to adjacent land, over relatively short distances.

B. Urban Streets

1. Major Thoroughfares - Major thoroughfares consist of Interstate, other freeway, expressway, or parkway roads, and major streets that provide for the expeditious movement of high volumes of traffic within and through urban areas.

2. Minor Thoroughfares - Minor thoroughfares perform the function of collecting traffic from local access streets and carrying it to the major thoroughfare system. Minor thoroughfares may be used to supplement the major thoroughfare system by facilitating minor through-traffic movements and may also serve abutting property.

3. Local Street - A local street is any street not on a higher order urban system and serves primarily to provide direct access to abutting land.

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1. The following design standards are in metric units. Conversion factors are included on page 11 of the Appendix.

C. Specific Type Rural or Urban Streets

1. Freeway, expressway, or parkway - Divided multilane roadways designed to carry large volumes of traffic at high speeds. A freeway provides for continuous flow of vehicles with no direct access to abutting property and with access to selected crossroads only by way of interchanges. An expressway is a facility with full or partial control of access and generally with grade separations at major intersections. A parkway is for non-commercial traffic, with full or partial control of access.

2. Residential Collector Street - A local street which serves as a connector street between local residential streets and the thoroughfare system. Residential collector streets typically collect traffic from 100 to 400 dwelling units.

3. Local Residential Street - Cul-de-sacs, loop streets less than 750 meters in length, or streets less than one and a half kilometers in length that do not connect thoroughfares, or serve major traffic generators, and do not collect traffic from more than 100 dwelling units.

4. Cul-de-sac - A short street having only one end open to traffic and the other end being permanently terminated and a vehicular turn-around provided.

5. Frontage Road - A road that is parallel to a partial or full access controlled facility and provides access to adjacent land.

6. Alley - A strip of land, owned publicly or privately, set aside primarily for vehicular service access to the back side of properties otherwise abutting on a street.

II. Property

A. Building Setback Line - A line parallel to the street in front of which no structure shall be erected.

B. Easement - A grant by the property owner for use by the public, a corporation, or person(s), of a strip of land for a specific purpose.

C. Lot - A portion of a subdivision, or any other parcel of land, which is intended as a unit for transfer of ownership or for development or both. The word "lot" includes the words "plat" and "parcel".

III. Subdivision

A. Subdivider - Any person, firm, corporation or official agent thereof, who subdivides of develops any land deemed to be a subdivision.

B. Subdivision - All divisions of a tract or parcel of land into two or more lots, building sites, or other divisions for the purpose, immediate or future, of sale or building development and all divisions of land involving the dedication of a new street or change in existing streets; provided, however, that the following shall not be included within this definition nor subject to these regulations: (1) the combination or re-combination of portions of previously platted lots where the total number of lots is not increased and the resultant lots are equal to or exceed the standards contained herein; (2) the division of land into parcels greater than four hectares where no street right-of-way dedication is involved, (3) the public acquisition, by purchase, of strips of land for the widening or the opening of streets; (4) the division of a tract in single ownership whose entire area is no greater than 0.8 hectares into not more than three lots, where no street right-of-way dedication is involved and where the resultant lots are equal to or exceed the standards contained herein.

C. Dedication - A gift, by the owner, of his property to another party without any consideration being given for the transfer. The dedication is made by written instrument and is completed with an acceptance.

D. Reservation - Reservation of land does not involve any transfer of property rights. It constitutes an obligation to keep property free from development for a stated period of time.

DESIGN STANDARDS

I. Streets and Roads

The design of all roads within the Planning Area shall be in accordance with the accepted policies of the North Carolina Department of Transportation, Division of Highways, as taken or modified from the American Association of State Highway Officials' (AASHTO) manuals.

The provision of street rights-of-way shall conform and meet the recommendations of the Thoroughfare Plan, as adopted by the municipality.

The proposed street layout shall be coordinated with the existing street system of the surrounding area. Normally the proposed streets should be the extension of existing streets if possible.

A. Right-of-way Widths - Right-of-way (ROW) widths shall not be less than the following and shall apply except in those cases where ROW requirements have been specifically set out in the Thoroughfare Plan.

	Min. ROW
1. Rural	
a. Principle Arterial	
Freeways	105 meters
Other	60 meters
b. Minor Arterial	30 meters
c. Major Collector	30 meters
d. Minor Collector	24 meters
e. Local Road	18 meters[1]
2. Urban	
a. Major Thoroughfare other than Freeway and Expressway	27 meters
b. Minor Thoroughfare	21 meters
c. Local Street	18 meters[1]
d. Cul-de-sac	Variable[2]

The subdivider will only be required to dedicate a maximum of 30 meters of right-of-way. In cases where over 30 meters of right-of-way is desired, the subdivider will be required only to reserve the amount in excess of 30 meters. On all cases in which right-of-way is sought for a fully controlled access facility, the subdivider will only be required to make a reservation. It is strongly recommended that subdivisions provide access to properties from internal streets, and that direct property access to major thoroughfares, principle and minor arterials, and major collectors be avoided. Direct property access to minor thoroughfares is also undesirable.

A partial width right-of-way, not less than eighteen meters in width, may be dedicated when adjoining undeveloped property that is owned or controlled by the subdivider; provided that the width of a partial dedication be such as to permit the installation of such facilities as may be necessary to serve abutting lots. When the said adjoining property is sub-divided, the remainder of the full required right-of-way shall be dedicated.

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[1] The desirable minimum right-of-way (ROW) is 18 meters. If curb and gutter is provided, 15 meters of ROW is adequate on local residential streets.

[2] The ROW dimension will depend on radius used for vehicular turn around. Distance from edge of pavement of turn around to ROW should not be less than distance from edge of pavement to ROW on street approaching turn around.

B. Street Widths - Widths for street and road classifications other than local shall be as recommended by the Thoroughfare Plan. Width of local roads and streets shall be as follows:

1. Local Residential
   Curb and Gutter section: 7.8 meters, face to face of curb
   Shoulder section: 6 meters to edge of pavement, 1.2 meters for shoulders

2. Residential Collector
   Curb and Gutter section: 10.2 meters, face to face of curb
   Shoulder section: 6 meters to edge of pavement, 1.8 meters for shoulders

C. Geometric Characteristics - The standards outlined below shall apply to all subdivision streets proposed for addition to the State Highway System or Municipal Street System. In cases where a subdivision is sought adjacent to a proposed thoroughfare corridor, the requirements of dedication and reservation discussed under Right-of-Way shall apply.

1. Design Speed - The design speed for a roadway should be a minimum of 10 km/h greater than the posted speed limit. The design speeds for subdivision type streets shall be:

Design Speeds

Facility Type	Design Speed km/h		
	Desirable	Minimum	
		Level	Rolling
RURAL			
Minor Collector Roads	100	80	70
Local roads including Residential Collectors and Local Residential	80	80	70
URBAN			
Major Thoroughfares other than Freeway or Expressway	100	80	80
Minor Thoroughfares	100	80	70
Local Streets	70	70	50

2. Maximum and Minimum Grades

a. The maximum grades in percent shall be:

Maximum Vertical Grade				
Facility Type	Design Speed (km/h)	Maximum Grade (Percent) Flat	Rolling	Mountainous
RURAL				
Minor Collector Roads*	30	7	10	12
	50	7	9	10
	60	7	8	10
	90	6	7	9
	100	5	6	8
	110	4	5	6
Local roads including Residential Collectors and Local Residential Streets*	30	-	11	16
	50	7	10	14
	60	7	9	12
	90	6	8	10
	100	5	6	-
URBAN				
Major Thoroughfares other than Freeway or Expressway	50	8	9	11
	60	7	8	10
	90	6	7	9
	100	5	6	8
Minor Thoroughfares*	30	9	10	12
	50	9	9	10
	60	9	8	10
	90	7	7	9
	100	6	6	8
	110	5	5	6
Local Streets*	30	-	12	17
	50	8	11	15
	60	8	10	13
	90	7	9	11
	100	6	7	-

b. Minimum grade should not be less than 0.5% .

c. Grades for 30 meters each way from intersections (measured from edge of pavement) should not exceed 5%.

* For streets and roads with projected annual average daily traffic less than 250 or short grades less than 150 meters long, grades may be 2% steeper than the values in the above table.

3. Minimum Sight Distance - In the interest of public safety, no less than the minimum sight distance applicable shall be provided. Vertical curves that connect each change in grade shall be provided and calculated using the following parameters:

Sight Distance					
Design Speed (km/h)	30	50	60	90	100
Stopping Sight Distance					
Minimum (meters)	30	60	80	140	160
Desirable Minimum (meters)	30	70	90	170	210
Minimum K* Value for:					
Crest curve	3	10	18	71	105
Sag curve	4	12	18	40	51

(General practice calls for vertical curves to be multiples of 10 meters. Calculated lengths shall be rounded up in each case.)

4. The "Superelevation Table" shown below and continued on the next page shows the minimum radius and the related maximum superelevation for design speeds. The maximum rate of roadway superelevation (e) for rural roads with no curb and gutter is 0.08. The maximum rate of superelevation for urban streets with curb and gutter is 0.06, with 0.04 being desirable.

Superelevation Table		
Design Speed (km/h)	Maximum e	Minimum Radius (meters)
50	0.04	100
60	0.04	150
90	0.04	375
100	0.04	490

* K is a coefficient by which the algebraic difference in grade may be multiplied to determine the length in meters of the vertical curve which will provide the desired sight distance. Sight distance provided for stopped vehicles at intersections should be in accordance with "A Policy on Geometric Design of Highways and Streets, 1990".

Superelevation Table continued		
Design Speed (km/h)	Maximum e	Minimum Radius (meters)
50	0.06	90
60	0.06	135
90	0.06	335
100	0.06	435
50	0.08	80
60	0.08	125
90	0.08	305
100	0.08	395

e = rate of roadway superelevation, meter per meter

D. Intersections

1. Streets shall be laid out so as to intersect as nearly as possible at right angles, and no street should intersect any other street at an angle less than sixty-five (65) degrees.

2. Property lines at intersections should be set so that the distance from the edge of pavement, of the street turnout, to the property line will be at least as great as the distance from the edge of pavement to the property line along the intersecting streets. This property line can be established as a radius or as a sight triangle. Greater offsets from the edge of pavement to the property lines will be required, if necessary, to provide sight distance for the stopped vehicle on the side street.

3. Off-set intersections are to be avoided. Intersections which cannot be aligned should be separated by a minimum length of 60 meters between survey centerlines.

E. Cul-de-sacs

Cul-de-sacs shall not be more than one hundred and fifty (150) meters in length. The distance from the edge of pavement on the vehicular turn around to the right-of-way line should not be less than the distance from the edge of pavement to right-of-way line on the street approaching the turn around. Cul-de-sacs should not be used to avoid connection with an existing street or to avoid the extension of an important street.

F. Alleys

1. Alleys shall be required to serve lots used for commercial and industrial purposes except that this requirement may be waived where other definite and assured provisions are made for service access. Alleys shall not be provided in residential subdivisions unless necessitated by unusual circumstances.

2. The width of an alley shall be at least six (6) meters.

3. Deadend alleys shall be avoided where possible, but if unavoidable, shall be provided with adequate turn around facilities at the deadend as may be required by the Planning Board.

G. Permits For Connection To State Roads

An approved permit is required for connection to any existing state system road. This permit is required prior to any construction on the street or road. The application is available at the office of the District Engineer of the Division of Highways.

H. Offsets To Utility Poles

Poles for overhead utilities should be located clear of roadway shoulders, preferably a minimum of at least 9 meters from the edge of pavement. On streets with curb and gutter, utility poles shall be set back a minimum distance of 1.8 meters from the face of curb.

I. Wheel Chair Ramps

All street curbs being constructed or reconstructed for maintenance purposes, traffic operations, repairs, correction of utilities, or altered for any reason, shall provide wheelchair ramps for the physically handicapped at intersections where both curb and gutter and sidewalks are provided and at other major points of pedestrian flow.

J. Horizontal Width on Bridge Deck

1. The clear roadway widths for new and reconstructed bridges serving 2 lane, 2 way traffic should be as follows:

a. Shoulder section approach

i. Under 800 ADT design year

Minimum 8.4 meters width face to face of parapets, rails, or pavement width plus 3 meters, whichever is greater.

ii. 800 - 2000 ADT design year

Minimum 10.2 meters width face to face of parapets, rails, or pavement width plus 3.6 meters, whichever is greater.

iii. Over 2000 ADT design year

Minimum width of 12 meters, desirable width of 13.2 meters width face to face of parapets or rails.

b. Curb and gutter approach

i. Under 800 ADT design year

Minimum 7.2 meters face to face of curbs.

ii. Over 800 ADT design year

Width of approach pavement measured face to face of curbs.

Where curb and gutter sections are used on roadway approaches, curbs on bridges shall match the curbs on approaches in height, in width of face to face of curbs, and in crown drop. The distance from face of curb to face of parapet or rail shall be a minimum of 450 millimeters, or greater if sidewalks are required.

2. The clear roadway widths for new and reconstructed bridges having 4 or more lanes serving undivided two-way traffic should be as follows:

a. Shoulder section approach - Width of approach pavement plus width of usable shoulders on the approach left and right. (Shoulder width 2.4 m minimum, 3 m desirable.)

b. Curb and gutter approach - Width of approach pavement measured face to face of curbs.

English To Metric Conversion Table			
English Units		S.I. Units	Abreviation
1 inch	equals	25.4 milimeters	(mm)
1 foot	equals	0.3 meters	(m)
1 mile	equals	1.6 kilometers	(km)
1 acre	equals	2.47 hectares	(hect)

Metric Equivalents		
1 millimeter	equals	0.001 meters
1 kilometer	equals	1000 meters
1 hectare	equals	10,000 square meters

Appendix D

COST ESTIMATES FOR PROPOSED PROJECTS

This is a guide in how cost estimates are calculated for proposed thoroughfare plan projects. Because these estimates are made on projects that do not have detailed functional designs, the results are general "ballpark figures." General percentages for contingency, preliminary engineering, and overhead, and typical costs are a compilation of information from the NCDOT Design Services Unit, Right-of-Way Branch, and highway construction cost estimate methodology obtained from the Durham TCC. Estimates are given in 1994 dollars, and rounded to the nearest thousand.

I-95 Widening

Roadway Widening

(1)	Widen 4 lanes to 6 lanes 12.10 km x $1,000,000/km	= $12,100,000
	TOTAL ROADWAY COST:	$12,100,000

Structures Cost Estimate

(1)	Widen Bridge (Tangent Section) 146 sq. m. x $650/sq. meter x 2	= $ 189,800
(2)	Grade Separation 2 x 850,000	= $ 1,700,000
	TOTAL STRUCTURES COST:	$ 1,889,800

(1)	Subtotal of Roadway and Struct.	= $ 13,989,800
(2)	Contingency Factor = 0.20 x (1)	= $ 2,797,960
(3)	Cost Plus Contingency = (1)+(2)	= $ 16,787,760
(4)	Preliminary Eng. = 0.10 x (3)	= $ 1,678,776
(5)	Overhead Factor = 0.15 x (3)	= $ 2,518,164
ESTIMATED CONSTRUCTION COST = Add 3-5		= $ 20,984,700

Right of Way Estimate

(1)	NCDOT owns sufficient ROW	= $ 0
ESTIMATED RIGHT OF WAY COSTS		= $ 0

Utility Relocation Cost

(1)	Negligible	= $ 0
ESTIMATED UTILITY RELOCATION COSTS		= $ 0

TOTAL PROJECT COST = = $ 20,985,000

US 158 Intrastate System Project

Roadway Construction

(1)	4 Lane Divided w/ 2 ft Paved Sh. 37.18 km x $1,100,000/km	= $40,898,000
(2)	2 lane Rural (NC 35 Reroute) 0.76 km x 650,000	= $ 494,000
	TOTAL ROADWAY COST:	$41,392,000

Structures Cost Estimate

(1)	New Bridges (Tangent Section) 3,439 sq.m. x $540/sq. meter	= $ 1,857,168
(2)	Interchanges - 2 Half Clover 2 x $5,000,000	= $ 10,000,000
	TOTAL STRUCTURES COST:	$ 11,857,168

(1)	Subtotal of Roadway and Struct.	= $ 53,249,168
(2)	Contingency Factor = 0.20 x (1)	= $ 10,649,834
(3)	Cost Plus Contingency = (1)+(2)	= $ 63,899,002
(4)	Preliminary Eng. = 0.10 x (3)	= $ 6,389,900
(5)	Overhead Factor = 0.15 x (3)	= $ 9,584,500
ESTIMATED CONSTRUCTION COST = Add 3-5		= $ 79,873,752

Right of Way Estimate

(1)	Vacant Land 532.91 acres x $1,000/acre	= $ 532,910
(2)	Impacted Homes (10)	= $ 387,000
(3)	Proximity Damages - 11 homes	= $ 38,500
(4)	Raw Right of Way Cost - Add 1-3	= $ 958,410
(5)	Administration/Acquis.=0.3 x (4)	= $ 287,523
(6)	Relocation Estimate = 0.1 x (4)	= $ 95,841
ESTIMATED RIGHT OF WAY COST = Add 4-6		= $ 1,341,774

Utility Relocation Costs

(1)	Length of Widening 7.65 km x $40,000/km	= $ 306,000
(2)	# Major Roads Intersected 13 crossings x $12,000/crossing	= $ 156,000
(3)	Adjusted Cost ((1)+(2))*1.10	= $ 508,200
ESTIMATED UTILITY RELOCTION COST		= $ 508,200

TOTAL PROJECT COST = = $ 81,724,000

NOTE: This Estimated Project Cost is for the Northampton County Portion only. The Garysburg Portion of this project was estimated in the 1994 Garysburg Thoroughfare Plan to be $11.8 million. This would bring the total cost for entire project from Halifax County to Murfreesboro bypass to $93,524,000

US 258 - Rich Square Bypass

Roadway Construction

(1)	2 Lane C&Guttter w/parking 2 sides		
	4.19 km x $850,000	= $	3,561,500
	TOTAL ROADWAY COST:	$	3,561,500

Structures Cost Estimate

(1)	No Structures Needed	$	0
	TOTAL STRUCTURES COST:	$	0

(1)	Subtotal of Roadway and Struct.	= $	3,561,500
(2)	Contingency Factor = 0.20 x (1)	= $	712,300
(3)	Cost Plus Contingency = (1)+(2)	= $	4,273,800
(4)	Preliminary Eng. = 0.10 x (3)	= $	427,380
(5)	Overhead Factor = 0.15 x (3)	= $	641,070
ESTIMATED CONSTRUCTION COST = Add 3-5		= $	5,342,250

Right of Way Estimate

(1)	Vacant Land		
	18.90 acres x $1,500/acre	= $	28,350
(2)	Impacted Homes (3)	= $	150,000
(3)	Proximity Damages - 5 homes	= $	12,500
(4)	Raw Right of Way Cost - Add 1-3	= $	190,850
(5)	Administration/Acquis.=0.3 x (4)	= $	57,255
(6)	Relocation Estimate = 0.1 x (4)	= $	19,085
ESTIMATED RIGHT OF WAY COST = Add 4-6		= $	267,190

Utility Relocation Costs

(1)	# Major Roads Intersected		
	3 crossings x $12,000/crossing	= $	36,000
(3)	Adjusted Cost (1)*1.10	= $	39,600
ESTIMATED UTILITY RELOCTION COST		= $	39,600

TOTAL PROJECT COST = = $ 5,649,000

NC 35 Realignment in Woodland

Roadway Construction

(1)	2 Lane C&Gutter w/ parking 1 side 1.37 km x $750,000/km	= $	1,027,500
	TOTAL ROADWAY COST:	$	1,027,500

Structures Cost Estimate

(1)	None Needed	= $	0
	TOTAL STRUCTURES COST:	$	0

(1)	Subtotal of Roadway and Struct.	= $	1,027,500
(2)	Contingency Factor = 0.20 x (1)	= $	205,500
(3)	Cost Plus Contingency = (1)+(2)	= $	1,233,000
(4)	Preliminary Eng. = 0.10 x (3)	= $	123,300
(5)	Overhead Factor = 0.15 x (3)	= $	184,950
ESTIMATED CONSTRUCTION COST = Add 3-5		= $	1,541,250

Right of Way Estimate

(1)	Commerical Land 1.00 acres x $2,500/acre	= $	2,500
(2)	Farmland/Residential 5.18 acres x $1,500/acre	= $	7,770
(3)	Impacted Business	= $	75,000
(4)	Raw Right of Way Cost - Add 1-3	= $	85,270
(5)	Administration/Acquis.=0.3 x (4)	= $	25,581
(6)	Relocation Estimate = 0.1 x (4)	= $	8,527
ESTIMATED RIGHT OF WAY COST = Add 4-6		= $	119,378

Utility Relocation Costs

(1)	# Major Roads Intersected 3 crossings x $12,000/crossing	= $	36,000
(2)	Adjusted Cost (1)*1.10	= $	39,600
ESTIMATED UTILITY RELOCTION COST		= $	39,600

TOTAL PROJECT COST =		**= $**	**1,700,000**

NC 305 Realignment/SR 1333 Improvement

Roadway Construction

(1)	2 Lane Rural - new location 1.71 km x $700,000/km	= $	1,197,000
(2)	Widen 18 ft section to 24 ft 3.87 km x $300,000/km	= $	1,161,000
	TOTAL ROADWAY COST:	$	2,358,000

Structures Cost Estimate

(1)	None Needed	= $	0
	TOTAL STRUCTURES COST:	$	0

(1)	Subtotal of Roadway and Struct.	= $	2,358,500
(2)	Contingency Factor = 0.20 x (1)	= $	471,600
(3)	Cost Plus Contingency = (1)+(2)	= $	2,829,600
(4)	Preliminary Eng. = 0.10 x (3)	= $	282,960
(5)	Overhead Factor = 0.15 x (3)	= $	424,440
ESTIMATED CONSTRUCTION COST = Add 3-5		= $	3,537,000

Right of Way Estimate

(1)	Vacant Land 7.71 acres x $1,000/acre	= $	7,710
(2)	Raw Right of Way Cost	= $	7,710
(3)	Administration/Acquis.=0.3 x (2)	= $	2,313
(4)	Relocation Estimate = 0.1 x (3)	= $	771
ESTIMATED RIGHT OF WAY COST = Add 4-6		= $	10,794

Utility Relocation Costs

(1)	# Major Roads Intersected 3 crossings x $12,000/crossing	= $	36,000
(2)	Adjusted Cost (1)*1.10	= $	39,600
ESTIMATED UTILITY RELOCTION COST		= $	39,600

TOTAL PROJECT COST =		**= $**	**3,588,000**